January 6, 1958

Paper Trade Journal

Woodpulp Substitutes — What are the potentials for growth in use of glass and synthetic fibers, bamboo, straw, and bagasse in papermaking? Three experts from I.P.C. give their answers

Anti-Skid Coatings — Various such coating methods and their application are discussed, including a definite statement as to where the operation should be done

NSSC Pulping in Italy — A detailed description of the first Italian bleached semichemical pulp mill, written by the man who helped start up the plant

MOORE & WHITE
DUPLEX BOARD CUTTER
d Air-Controlled
UPLEX SLITTER

Rugged Construction for 'round the clock operation . . . On the Machine

The DUPLEX CUTTER can be adjusted while in operation for changes in lengths. A special feature also permits adjustment of draw between sections, assuring accurate cutting even when varying sheet conditions occur.

The DUPLEX SLITTER is designed particularly for use with the M. & W. Duplex Cutter but will also give excellent results with any other cutter. Changes in widths can be made in seconds while machine is in operation.

The MOORE & WHITE Company

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SPECIAL . . . for chlorine service

OIC 600-LB. FORGED STEEL, O. S. & Y. VALVES

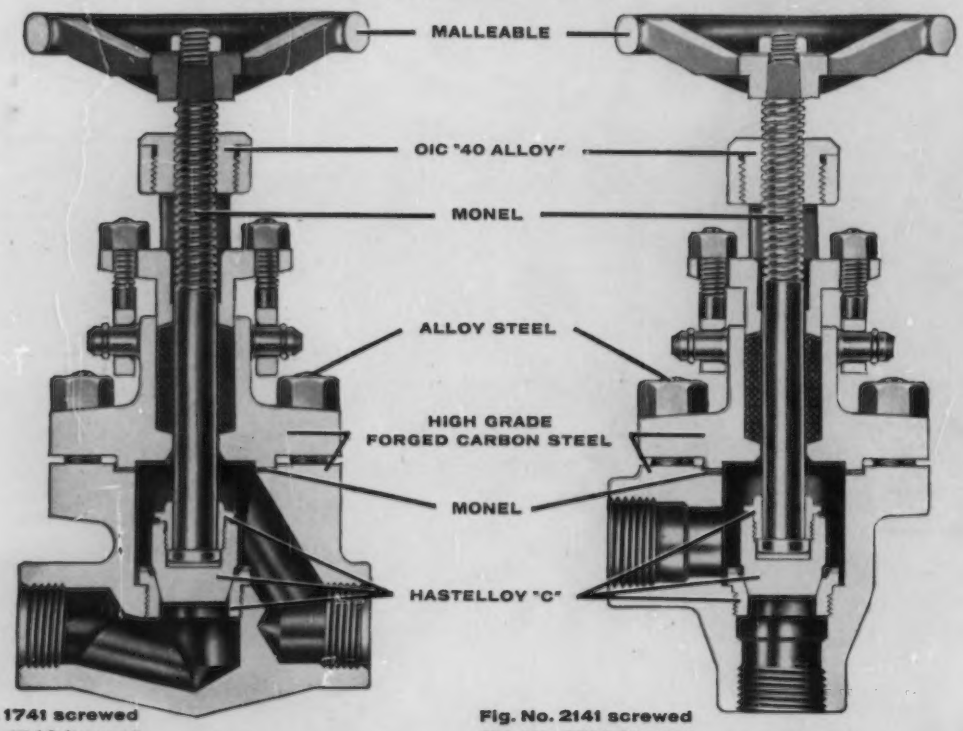

Fig. No. 1741 screwed
Fig. No. 1740 flanged

Fig. No. 2141 screwed
Fig. No. 2140 flanged

Proper design and the correct choice of metals combine in this OIC Forged Steel line to assure adequate strength, safety, and long trouble-free operation on chlorine service.

Hastelloy "C" swivel nut—disc—seat ring—Resist corrosive action of chlorine, increasing service life.

Monel stem—body-bonnet gasket—The monel stem resists corrosion. It is of generous size and accurately machined for ease of operation. The soft monel gasket is ideal for chlorine service.

OIC "40 Alloy" yoke bushing—"40 Alloy" is an aluminum-silicon-bronze which will not corrode, gall or seize. Its use adds to the ease of operation and increases the valve's service life.

High-Grade Forged Carbon Steel pressure parts—Amply proportioned wall thicknesses throughout provide strength and safety.

Alloy Steel Bolting 4 bonnet studs—Of proper size and quality to assure safety and ruggedness at the joint.

Malleable handwheel—Heavy and large, shaped for non-slip gripping.

Packing is resistant to the corrosive action of chlorine. A back seating arrangement permits repacking in a full open position.

A wide seating surface of 30° included angle permits close flow regulation. Each valve is carefully inspected at assembly, and tested at 300 psi air under water.

Write for Bulletin No. 1000, which describes these valves more fully. It also contains information on valves for black, green and white liquor services. Request also Bulletin No. 195, which describes the redesigned OIC line of Forged Steel Gate Valves.

Contact your nearby OIC Distributor for all your valve needs.

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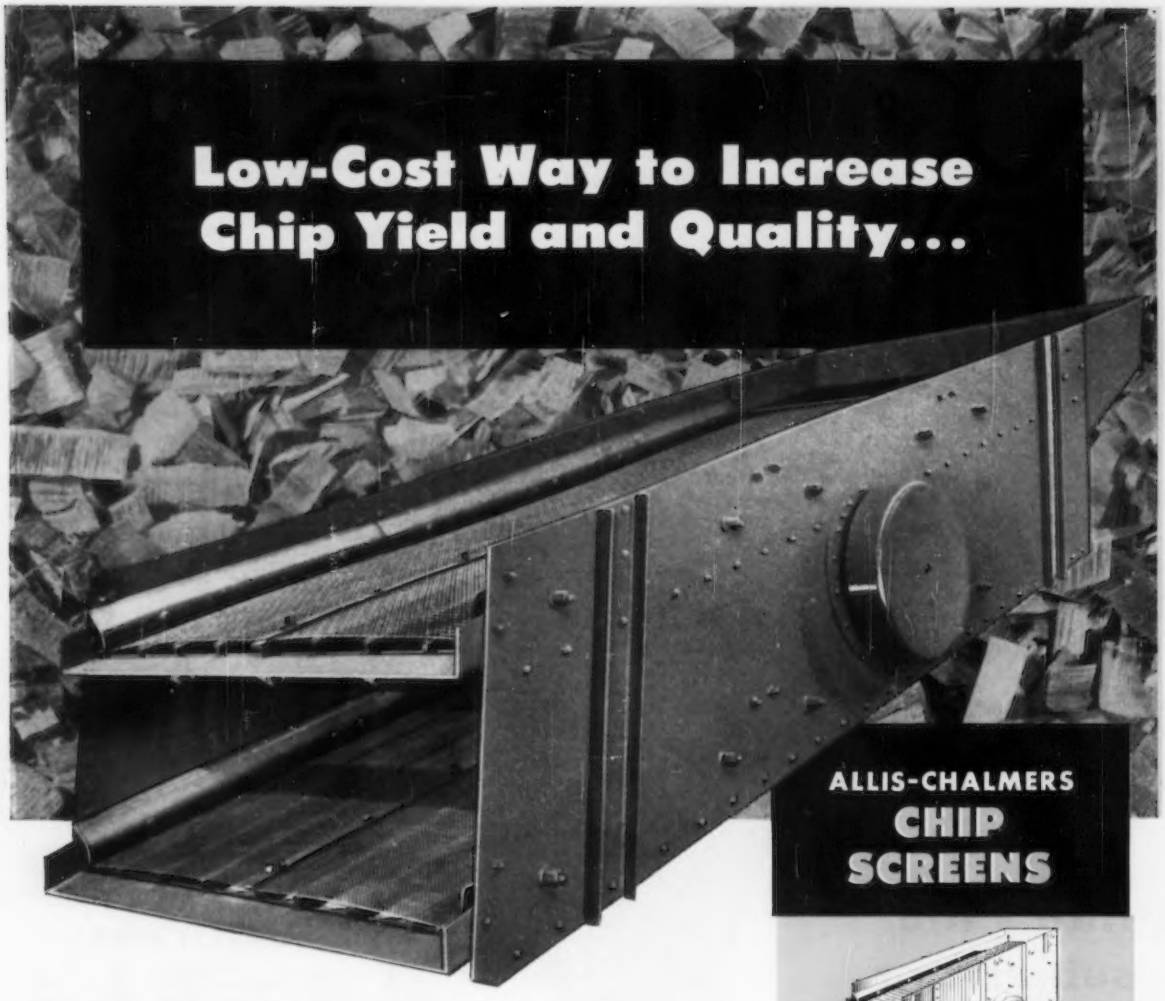
CONTEST RULES

1. The contest is open to all employees of pulp and paper mills in North America.
2. Your paper should be confined to 1500 words, typed with double spacing on one side only of plain sheets, 8½" x 11".
3. Place your name, the name and address of your mill, your position or duties and your home address on the cover sheet only. This information must not appear in the manuscript.
4. Mail your entry before midnight March 31, 1958 to: The Secretary and Treasurer, The American Pulp and Paper Mill Superintendents Association, 327 So. LaSalle Street, Chicago 4, Illinois.

*Co-sponsored by: John W. Bolton & Sons, Inc. and The Emerson Manufacturing Co. Division, Lawrence, Massachusetts. The American Pulp and Paper Mill Superintendents Association, Chicago, Illinois.

Low-Cost Way to Increase Chip Yield and Quality...



ALLIS-CHALMERS CHIP SCREENS

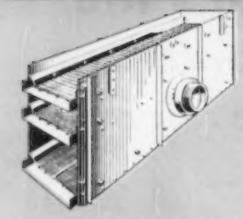
Increased Yield — In this Allis-Chalmers screen, the accurately balanced mechanism imparts efficient vibration to the entire screen surface and body structure. As a result, chip travel is uniform, stratification rapid. Capacity is further increased because apertures remain open. A feed spout spreads feed over entire screen width, turning slivers on their sides as they are conveyed onto screen surface, thereby increasing efficiency. Protection against blinding of the chip dust deck may be obtained through the installation of a *Sta-Kleen* deck.

Improved Quality — Allis-Chalmers chip screens also help you maintain positive control over pulp quality. Because of the efficient circle-throw action of the mechanism an unusually high percentage of chip dust and dirt is removed.

Low Cost — Best of all, there is long-term economy in installing an Allis-Chalmers chip screen. The initial cost is low. Power requirements and maintenance are kept at a minimum by the simplified two-bearing mechanism.

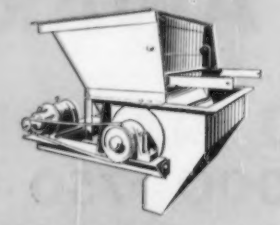
Allis-Chalmers also offers horizontal screens for limited headroom applications. For complete information, see your A-C representative or write Allis-Chalmers, Industrial Equipment Division, Milwaukee 1, Wisconsin. Ask for Bulletin 07B6353B.

Sta-Kleen is an Allis-Chalmers trademark.



Triple-deck screen increases efficiency

Top deck removes slivers; second deck relieves load so that a maximum of pin chips, dust and dirt may be removed.



Chip screen feeder provides full width feeding

Screening is more efficient, more profitable, because *all* of the screen area works *full* time. Eliminates surges.

ALLIS-CHALMERS

A-5515

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PAPER TRADE JOURNAL

Published Weekly Since 1872

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REMEMBER THESE DATES . . .

JAN. 23: Western Michigan University's Annual Pulp & Paper Conference, Kalamazoo, Mich.

JAN. 29-31: Canadian Pulp & Paper Assn. Annual Meeting at Mount Royal Hotel, Montreal, Canada.

FEB. 16-21: Paper Week in New York.

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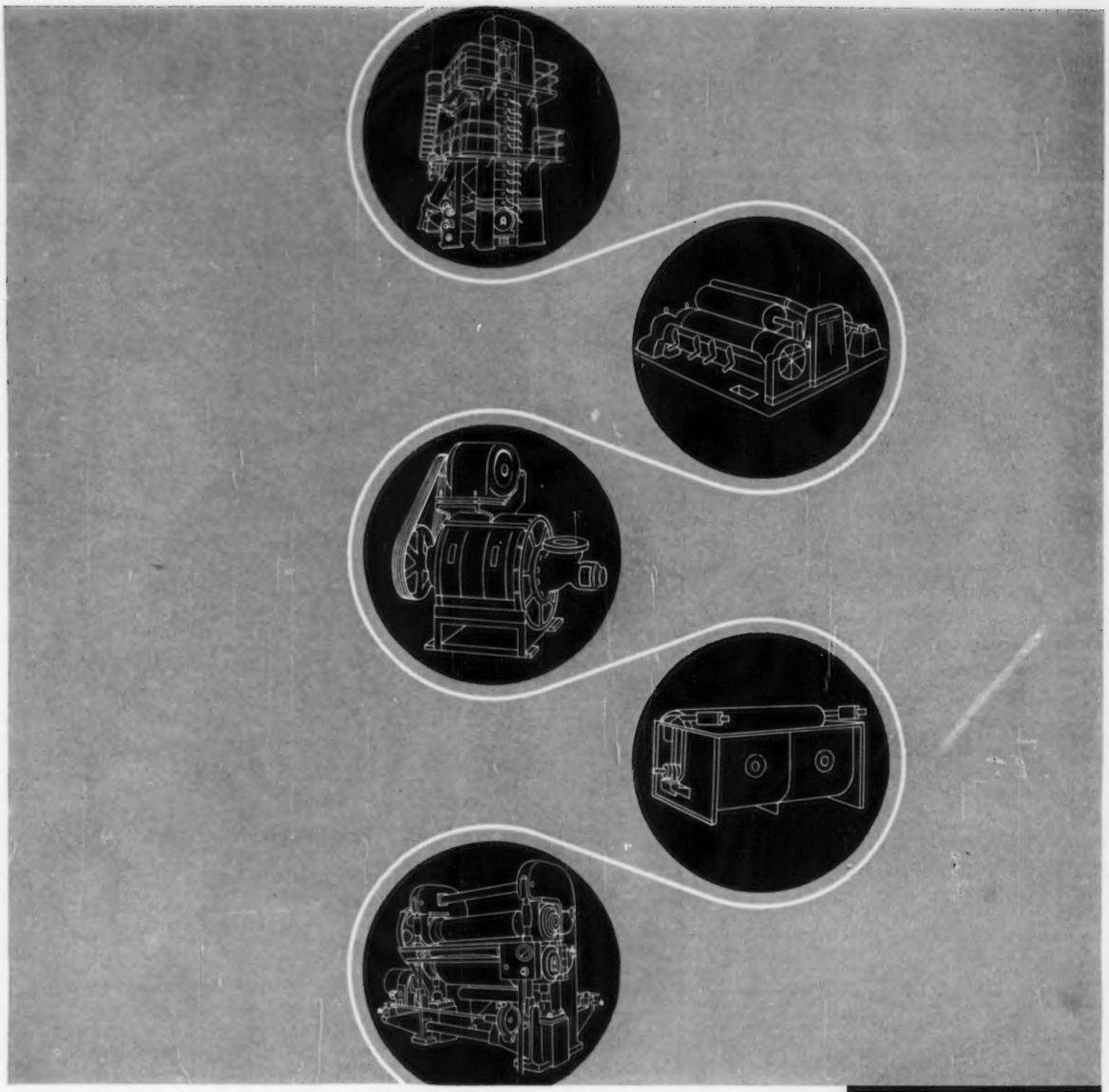

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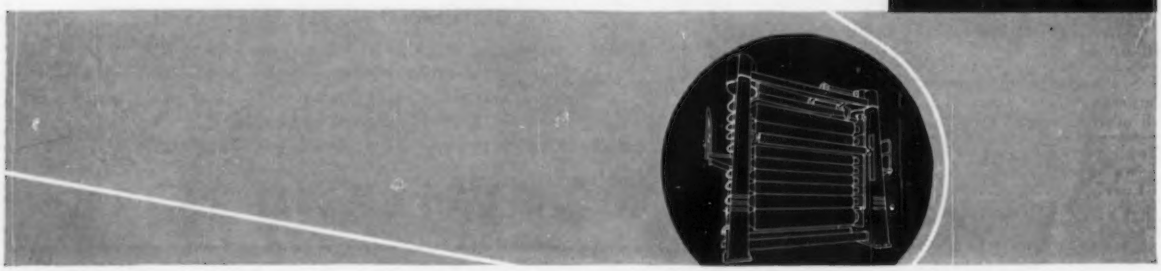


SCRIPTITE* 54

for specialty and decorative papers

Scriptite 54 water-based coatings, applied on or off machine, give specialty packaging papers excellent water and wet rub resistance, good folding endurance. Shelf and wall papers can be given high gloss, exceptional printability, ink absorption and varnish hold-up properties. Upgrade your paper products with Scriptite 54. Write for laboratory samples and technical literature. And call on the Monsanto Paper Resins Dept. for technical assistance. Monsanto Chemical Company, Plastics Division, Room **1848,** Springfield 2, Mass.

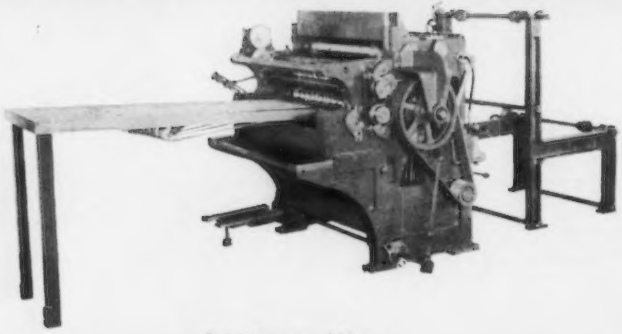
MONSANTO

The Monsanto Line of Paper Resins also includes

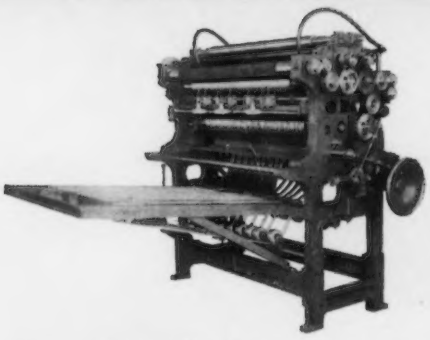
SCRIPTITE 33 . . . *a melamine wet-strength resin.*
SCRIPTITE 40 . . . *a urea wet-strength resin.*
SCRIPTITE 52 . . . *in combination with formaldehyde to give water resistance to folding boxboard and to jute liner.*
SCRIPTITE 50 . . . *for unsurpassed printability and improved surface characteristics on boxboard.*

*SCRIPTITE: REG. U. S. PAT. OFF.

THESE FOLDERS ARE DELIVERING

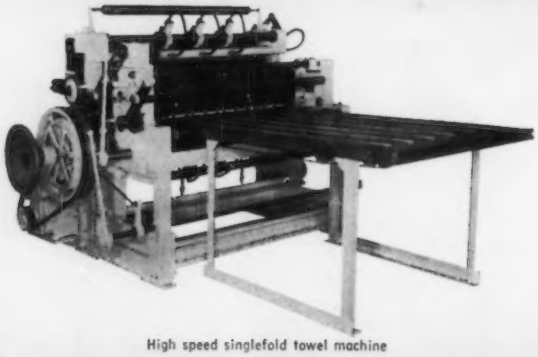


Facial tissue interfolder

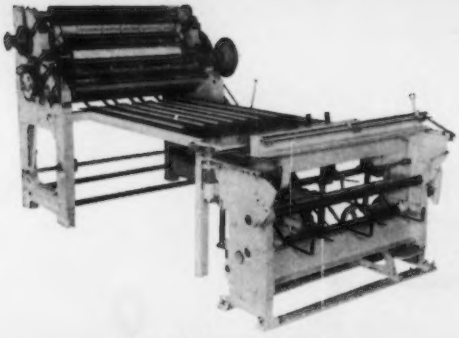


Wax paper interfolder

THE PERFORMANCE WE PROMISED

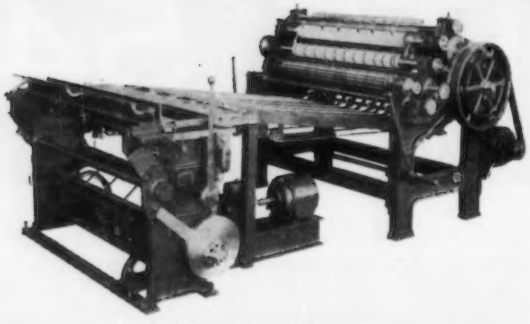


High speed singlefold towel machine

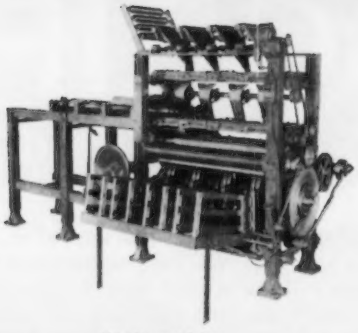


Multifold towel folder and package press

ASK THE COMPANIES THAT OWN THEM



Doublefold toilet tissue interfolder



C-fold towel folder

printing presses, rewinders, embossers, folders,
napkin and core machines and special converting machines

PAPER CONVERTING MACHINE COMPANY

GREEN BAY, WISCONSIN

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ELLIOTT
Fabri-Seal
INSULATION

not one insulation failure in 8 years . . .

IMMERSION "TORTURE-TEST" evaluates coil insulation longevity

The Elliott immersion "torture-test" (above) was created to evaluate the life expectancy of stator coils. It quickly locates potential trouble spots such as air pockets or entrapped moisture. Countless systems were rejected before a fabricating system was developed which would stand up to the "torture-test" of continuous application of 150% of rated voltage while the coil is immersed in a conducting liquid.

A 1950 installation (right) of an Elliott weather-protected motor with Fabri-Seal insulation.

Developing the Elliott Fabri-Seal insulation system for large induction motors—the system that established the 8-year service record—requires more than new materials and fabrication methods. Accelerated life-testing of hundreds of insulating systems over the years was also involved.

The perfected system—Elliott Fabri-Seal Coil Insulation—has been used in 1,900,000 hp of large squirrel-cage induction motors now in service all over the country. These machines have been operating since 1948 *without one single insulation breakdown*—an unprecedented service record. For details, contact the Elliott Company, Ridgway, Pa.

ELLIOTT Company

R7-27

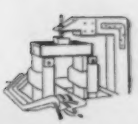
FIVE OTHER REASONS
WHY ELLIOTT "FABRI-SEAL"
INSULATION INSURES
LONGER SERVICE LIFE

MYLAR*-BACKED MICA SEALS COIL SLOT SECTIONS

*Dupont trademark

SEALED AT ALL VULNERABLE POINTS

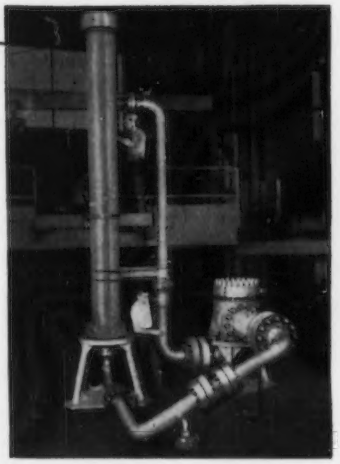
VACUUM AND PRESSURE IMPREGNATION



TURN-TO-TURN TESTED AT HIGH SURGE VOLTAGES

EVERY STATOR IMMERSED AND BAKED

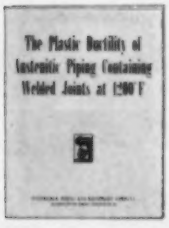
ALL IN A DAY'S WORK at *Pittsburgh Piping*



STAINLESS STEEL AUTOCLAVE and VOLUTE *Shop Fabricated*

by *Pittsburgh Piping*

This autoclave and volute assembly is typical of the work that goes through Pittsburgh Piping shops. Fabricated of Type 304 Stainless Steel, it is complex in design and is built for high pressure, high temperature service. This type of fabricating is a "natural" for Pittsburgh Piping. We pioneered the application of austenitic steel piping materials for central stations operating at 1050°F. and above, and fabricated the piping for the world's first atomic-powered submarine and central station. Highly specialized methods, machines, and apparatus have been developed and are employed in this work. Use them on your high temperature, high pressure piping jobs.



WRITE FOR YOUR COPY

This bulletin reports an intensive investigation into the problem of main steam piping materials and gives data on the stress rupture characteristics of Types 316 and 347 stainless steel piping adjacent to welded joints.

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PP-32

In waxed papers... for opacity that rings up sales—

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Be sure of getting the very maximum in clear, white opacity—opacity that is stable to waxing—by selecting UNITANE titanium dioxide. *It's good sales insurance!* Specify UNITANE O-110 for its whiteness, opacity, and exceptional water dispersion. Your Cyanamid Pigments representative will gladly supply samples and detailed technical information.

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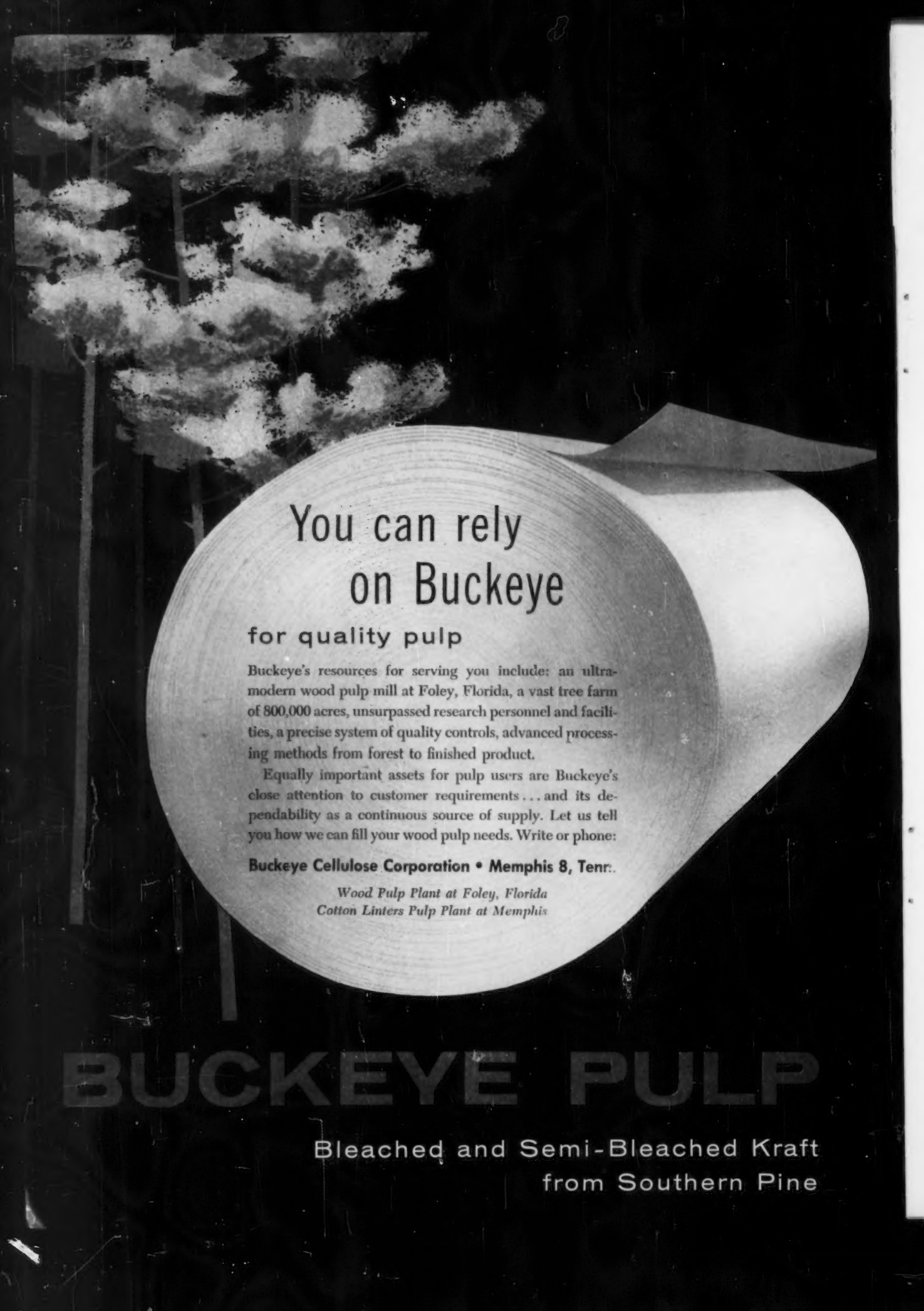
WHITEN AND BRIGHTEN WITH UNITANE


You can rely
on Buckeye
for quality pulp
Buckeye's resources for serving you include: an ultra-modern wood pulp mill at Foley, Florida, a vast tree farm of 800,000 acres, unsurpassed research personnel and facilities, a precise system of quality controls, advanced processing methods from forest to finished product.
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BUCKEYE PULP
Bleached and Semi-Bleached Kraft
from Southern Pine

December Operating Rates for Mills

In the first three weeks of December the paper mills ran at 92% of capacity (1956—99%) and paperboard mills at 90% (1956—95%). Therefore the paper mills ran at close to 91.1% during 1957 (1956—98%) and the board mills also ran 91% (1956—94%).

1957 Paper and Board Production

Production of paper and board for 1957 totaled an estimated 30,700,000 tons according to A.P.P.A. Though a 2% decrease below 1956, it still represented the second best year in the history of the industry. The dollar volume of sales in 1957 amounted to $10,500,000,000, within 1% of the value of shipments in 1957. However, while production and sales were relatively well maintained, the combined effect of rising transportation, labor and material costs, and under utilization of the industry's increased capacity to produce, was to reduce the industry's profits by 18%.

Some More Predictions

As the new year opens, pronouncements and predictions on the probable business pattern for 1958 continue to pour forth from experts and would-be experts. None of these are really pessimistic and excepting a few enthusiastic optimists there is fairly general agreement on the broad pattern. These can be summed up as follows —Business activity in the first half or three-quarters of 1958 will be no better than the last quarter of 1957, and may be off slightly. However this will, it is thought, represent a decline of only a few per cent below the first half of 1957. The beginning of an upswing is generally predicted for the fall of 1958 with further acceleration in 1959.

Outlook for Woodpulp Replacements

Will bamboo, bagasse, straw, and other possible papermaking fiber sources make any substantial replacement in the use of wood pulp in this country? A definite no is the answer of three Institute of Paper Chemistry experts in an authoritative article in this issue.

Waste Paper Prices Steady

Outlook for waste paper prices in January is that there will be few changes over December and these will be small.

A New Year's Message

This new year will require the salesmen in our industry to sell harder than they have since the war, because of the decline in business activity combined with our recent and still coming expansions in capacity. Our companies must step up their research for new products and new uses for existing ones, and increase their expenditures on advertising and sales promotion. Now is not the time to take the short-sighted view of curtailing budgets for these vital means of moving our production into the hands of customers.

if you make

MAGAZINE PAPER
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LINER
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can improve your products

details on request

R. T. VANDERBILT CO., INC.
230 Park Avenue, New York 17, N. Y.

W. Va. Plans $40 Million Debentures

West Virginia Pulp & Paper Co. has filed a registration statement with the Securities and Exchange Commission covering $40 million of 20-year debentures to help finance another phase of a long-range growth program.

Since the end of World War II the company has completed $160,000,000 in capital improvements at its six pulp and paper mills and 15 corrugated box factories, financing the projects largely from internal funds.

Company officials said the new funds would be applied to projects contemplated for some time as part of this continuing program of plant improvements and additions.

One major project will be the addition of two paper machines and supporting facilities at the company's Luke, Md., mill which are being installed later than originally contemplated due to market conditions. The first of these machines is not scheduled for completion until 1960.

Fibreboard Sells Metuchen Plant

Fibreboard Paper Products Corp. announced the sale of its Metuchen, N. J., floor covering plant to City Investing Co. of New York, a real estate investing concern.

The plant has been closed down since last August when Fibreboard said it would concentrate floor covering manufacture at its Emeryville, Calif. plant.

"The disposition of our property at Metuchen will result in an increase in the company's cash position by more than seven million dollars," W. L. Keady, president, stated. This total includes the proceeds from the sale of the plant site and buildings, residual inventory converted to cash, as well as a substantial tax credit, the concern said.

Mr. Keady said the increase in available cash will enable Fibreboard to further emphasize its program of expansion in operations yielding the greatest profit. Other Fibreboard products include paperboard and building materials.

Scholarship Plan for Potsdam

Establishment of a scholarship awards program for employees of the Potsdam, N. Y. mill of Nekoosa-Edwards Paper Co. has been announced by the company.

The plan provides for one $500 award to be made each year which may be renewed yearly for a maximum of three additional years or until the student receives a bachelor's degree. Eligible employees of the paper company and their children may apply. The plan also provides for an annual cost of education grant equivalent to the tuition but not to exceed $500 per year, which will go to any college or university in New York state attended by the scholarship winner.

Paper and Board Production

According to the American Paper and Pulp Assn., the ratio of the Uniter States production to mill capacity for the week ending December 21, 1957, was 93.5 per cent compared with 91.2 per cent revised for the preceding week. The ratio was 99.3 per cent for the corresponding week a year ago. Mills producing newsprint exclusively are not included.

The paperboard production ratio for the week ending December 21, 1957, was 93 per cent compared with 92 per cent for the preceding week and 96 per cent for the corresponding week last year.

(Detailed statistics on page 40.)

Kaiser Plant Shipping Paper-Foil Laminates

First shipments of laminated foil materials are being made this month from Kaiser Aluminum & Chemical Corp.'s new foil processing plant at Belpre, Ohio.

A full range of aluminum foil-to-paper and foil-to-paperboard laminations for converters, manufacturers of packages for food process and industrial users and the tobacco industry will be produced by the Belpre facility. For several months the plant has been packaging Kaiser Aluminum household foils for markets in the eastern half of the nation.

Wolf Sells Envelope Division

Wolf Bros., Inc. of Philadelphia, Pa. announces that on December 31, 1957, the equipment and inventory of their envelope division, Wolf Brothers Co., were sold to the Transo Envelope Co. of Chicago, Illinois.

Howard A. Wolf, chairman, stated that the sale of the envelope division will in no way effect the activities of Wolf Bros., Inc., but will provide additional space and resources for the expansion of the facilities needed by the Company in the manufacturing of their growing retail packaging product line.

New Officers of Sulphite Pulp Group

Stanton W. Mead, president of the Consolidated Water Power & Paper Co., Wisconsin Rapids, has been elected president of the Sulphite Pulp Manufacturers' Research League at Appleton, Wis.

Other officers elected are Gilbert Heat, vice president of the Falls Paper & Power Co., vice president; John G. Strange, president of the Institute of Paper Chemistry, secretary, and P. M. Chiuminatto, vice president and treasurer of the Charmin Paper Co., treasurer. All trustees of the league were re-elected.

NEWLY COMPLETED South Research Building at Appleton, Wis.

Institute of Paper Chemistry's New Building

The Institute of Paper Chemistry, Appleton, Wis., has completed its first unit, the South Research Building, in a major building program announced in May 1956. This finished structure of cement block construction with brick facing cost $200,000 and consists of one story and full basement which provide 16,000 sq. ft. The main floor, which has been leased to the Sulphite Pulp Manufacturers' Research League, contains three areas: offices with a conference room, a large laboratory, and a pilot plant. The basement will be used by the Institute for expanding operations. Special installations include a refrigerated room maintained at 40° F. and an incubation room at 80° F.

The second unit, scheduled for completion in February, is parallel to the Container Building and adjoining it. The combined structures now become the Central Research Building. The new portion, built of concrete block with brick facing, will cost about $178,000, and contains within its one story and complete basement 12,800 sq. ft. This addition will house the Graphic Arts Section, Paper Evaluation Section, and part of the Container Section. The remainder of the main floor will include a conventional laboratory and seven offices. Semi-commercial equipment of the Container Section will be installed in the basement.

The third unit, the Court Addition, is expected to be finished in July. It will connect the 1942 wing of the original building with the General Activities Building, dedicated in 1953. The exterior of limestone facing and concrete stucco will match these earlier structures. This unit, costing approximately $427,000 will give the Institute an additional 23,000 sq. ft.

WMU Orders Model Paper Machine

Western Michigan University's department of paper technology has placed an order with the Wheeler Roll Co., Kalamazoo, for a laboratory pilot model fourdrinier.

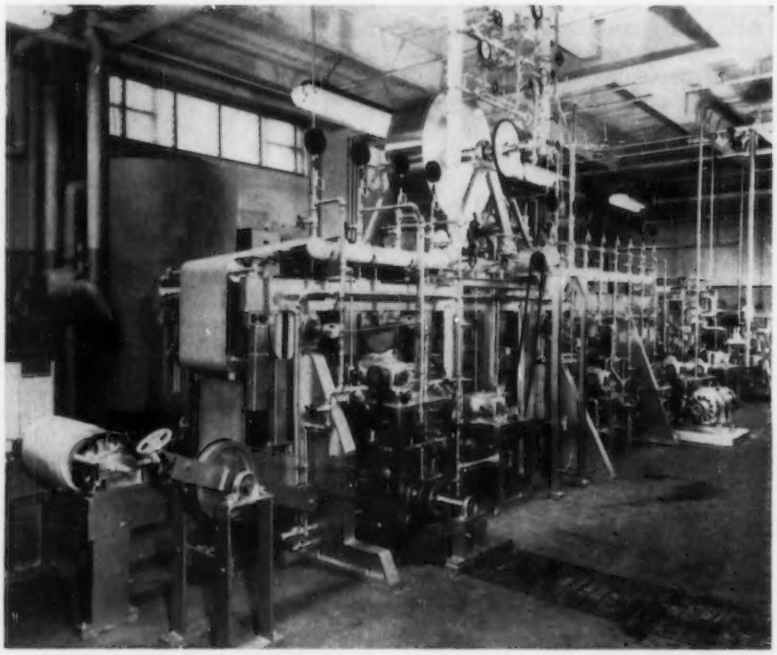
The 24-inch machine will be ready for operation in November 1958, and will be installed in the pilot laboratory provided in the new Paper Industry Laboratories building.

The installation, including stock preparation equipment, is expected to cost nearly $80,000, and has been made possible through funds provided by interested persons.

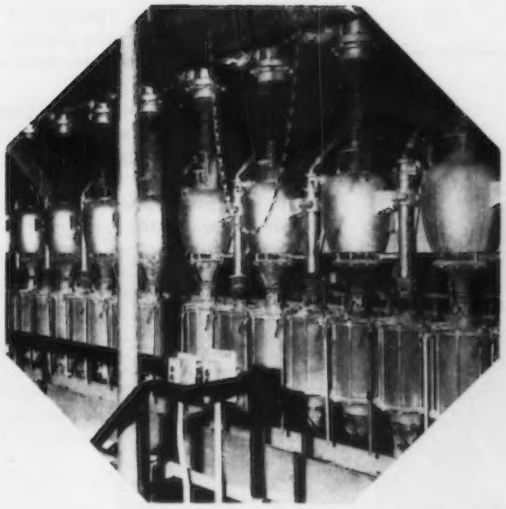
A wide range of speeds will be possible on the machine, from 30 to 500 feet per minute, and will permit the experimental manufacture of tissue, fine paper, bristol and sanitary food board. It will be used for instruction, research and development work, and will be available to the paper industry for experimental work.

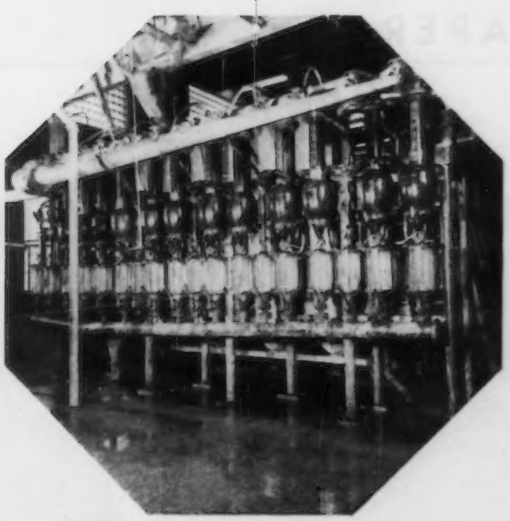
Already on hand for the installation is a stainless steel Shartle Hydrapulper, given to the university several years ago by the Black-Clawson Co.

Also to be purchased for stock preparation is a 250-lb. Jones beater, and agitated stock chest made by the Kalamazoo Tank and Silo Co., and a Jones midget jordan.

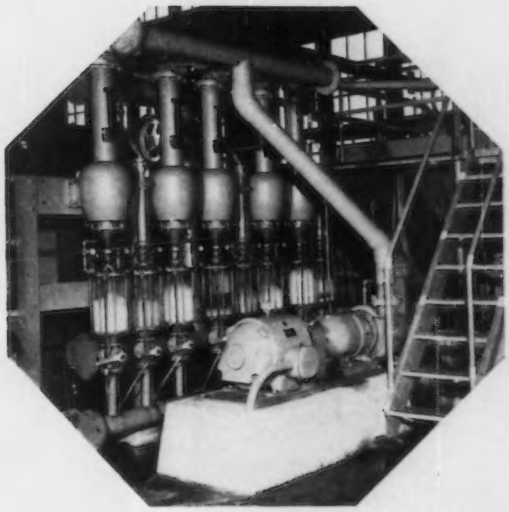


MACHINE SIMILAR to the 24-inch fourdrinier ordered by Western Michigan University's department of paper technology.





STOP-SIGNS FOR DIRT



Abrasive particles of dirt, sand, metal and grit can't get through to damage machine wires and roll surfaces . . . to spoil paper quality . . . not when Dirtecs stand guard.

Dirtecs deliver clean stock in full volume without mixing any of it with the rejects. They come in regular and king-size to handle any volume.

Look into low cost Dirtec protection for any kind of pulp, board or paper stock. Ask for recommendations, layouts and estimates.

BIRD MACHINE COMPANY
SOUTH WALPOLE, MASSACHUSETTS
REGIONAL OFFICES: EVANSTON, ILLINOIS
PORTLAND, OREGON • ATLANTA, GEORGIA
Canadian Manufacturers of Bird Machinery
CANADIAN INGERSOLL-RAND CO., Limited, Montreal

BIRD DIRTECS

F. L. Zellers

N. A. Seidensticker

Harold L. Breiel

Thomas J. Rigney

W. A. Thomas

Kon Matchuk

Chillicothe Executive Changes

The election of F. L. Zellers, vice president; N. A. Seidensticker, vice president and general manager; Harold L. Breiel, secretary-treasurer; and Thomas J. Rigney, controller, by the board of directors of the Chillicothe Paper Co. and the promotion of W. A. Thomas to the position of mill manager and Kon Matchuk to the position of general superintendent has been announced by Chillicothe Paper Co., Chillicothe, Ohio.

Roy Zellers joined Chilpaco in 1940 as superintendent. He has been mill manager since 1955. He is a member of the Board of Directors of the Superintendents Association and was its president 1937-38.

Norb Seidensticker joined Chilpaco in the traffic department in 1928 and he was promoted to manager of costs in 1938. In 1945 he was elected treasurer and since 1954 he has been secretary-treasurer.

Harold Breiel joined Chilpaco in 1932 as assistant bookkeeper; became bookkeeper in 1945 and later the same year he was elected controller.

Tom Rigney joined Chilpaco in 1941 in the office of the controller. Since his return from service in the navy he has been costs assistant.

Art Thomas joined Chilpaco in 1945 as chief engineer. Since 1950 he has been assistant mill manager and chief engineer.

Kon Matchuk joined Chilpaco in 1955 as assistant to the mill manager. Since July 1956 he has been paper mill superintendent.

Other officers of Chillicothe Paper Co. are: A. I. Cahill and George H. Pringle, vice presidents, and W. Walker Lewis Jr., assistant secretary.

Dickey Elected Pres. of B. C. Forest Products

Charles D. Dickey Jr., has been elected president of British Columbia Forest Products Ltd. He fills the vacancy created by the death of Hector G. Munro on December 2.

Mr. Dickey has been a member of the board of directors of British Columbia Forest Products Ltd. since December 1955. Prior to his election as president, he was assistant vice-president of Scott Paper Co., responsible for West Coast operations with headquarters in Everett, Wash., having originally joined the company in 1946 as a member of its sales force in New York City.

Raymond Bag Promotes Two

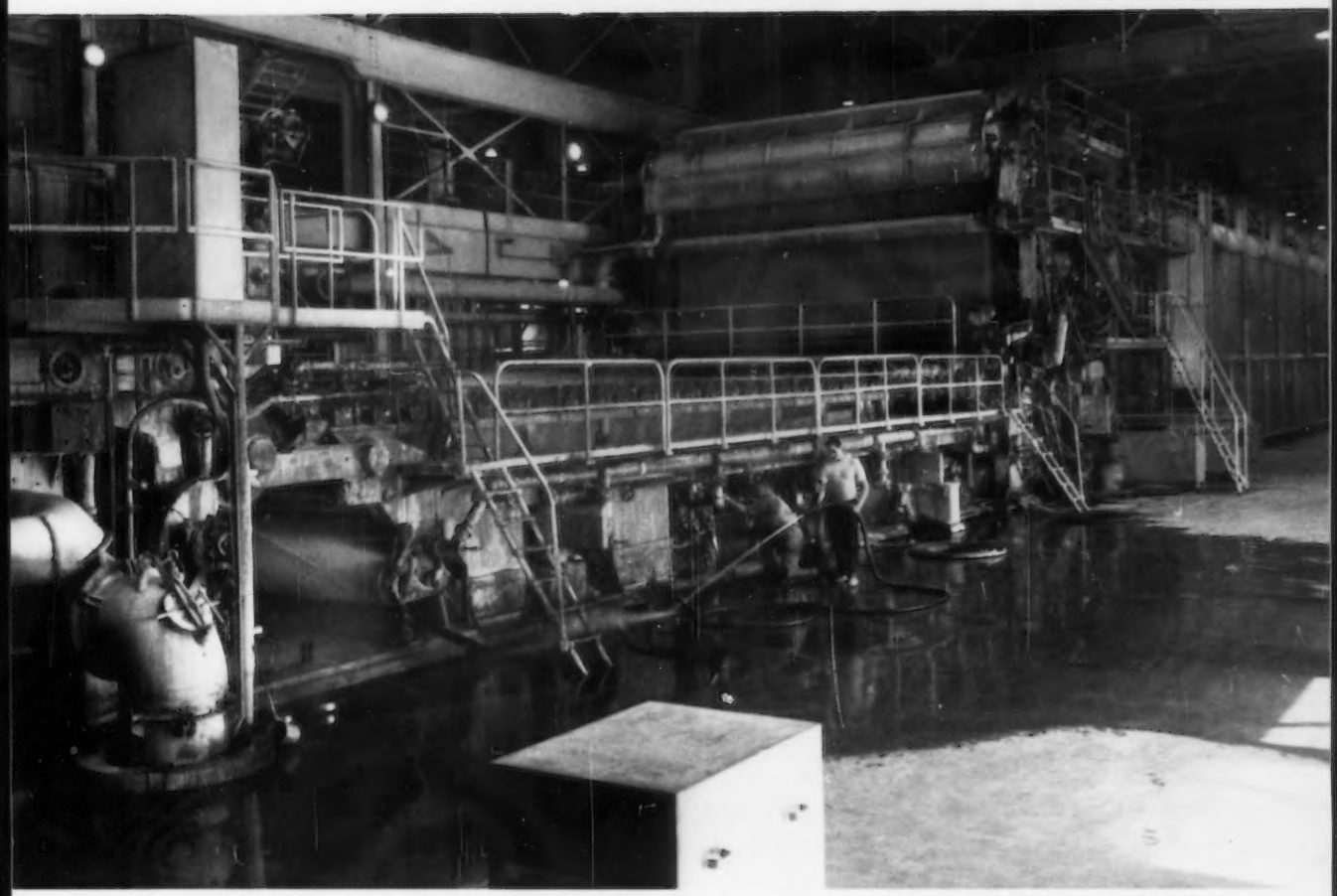
Promotions of two top executives of Raymond Bag Corp., Middletown, Ohio, were announced by the Albemarle Paper Manufacturing Co., Richmond, Va., parent company.

Clarence L. Mers, who has been president of Raymond since its incorporation two years ago, has been elected board chairman.

J. R. Clements has been elected president, succeeding Mr. Mers.

Mr. Mers joined the original Raymond Bag Co. in 1922, and became secretary and later president of the company. Upon the dissolution of the company late in 1955, and the purchase of its assets by Albemarle, he was elected president of the new corporation.

Mr. Clements has been vice president, sales, of Raymond Bag Corp. He has been associated with Albemarle during the past 5½ years.



#10 MACHINE, KENORA, ONTARIO, CANADA.

The Ontario-Minnesota Pulp and Paper Co., Ltd.

Mando's new #10 machine at Kenora keeps pace with papermaking progress. This 276" high-speed, high-production Beloit Newsprint machine is among the most modern in Canada. The machine is completely equipped for newsprint manufacture at new levels of quality and production.—"*Your partner in papermaking,*" *Beloit Iron Works, Beloit, Wisconsin.*

Leon Henderson Named Doeskin President

Leon Henderson has become president of Doeskin Products, Inc. Mr. Henderson was administrator of the federal Office of Price Administration during World War II.

Cornell Paperboard Elects Assistant Sec.-Tr.

Robert B. Nienow has been elected assistant secretary and assistant treasurer of Cornell Paperboard Products Co., Milwaukee, Wis. He succeeds George J. Christiansen, who retired. Donald F. Becker, controller, also was elected an officer of the company with no change in title.

Changes in Paper Mill and Finishing at Hammermill

A number of staff changes have been made in the paper mill and finishing division at Hammermill Paper Co. C. L. Anderson has been appointed paper mill superintendent and R. R. Buchmeyer, assistant paper mill superintendent. In the paper mill, D. A. Jacobsen is technical co-ordinator, T. Kuntz is general foreman and R. F. Meyer is relief supervisor. In the finishing department the following appointments have been made: J. Lewis, assistant finishing superintendent, J. Ogle, general foreman and T. Beringer, converting foreman.

C. F. Kingston, former paper mill superintendent is now development engineer in the technical department.

Container Corp. Appoints Plant Managers

Stanford H. Collins has been appointed plant manager of Container Corp. of America's paperboard mill in Cincinnati, Ohio.

He joined Container Corp. at the company's Carthage, Ind., strawboard mill in 1947. He held various positions in maintenance, personnel, purchasing and supervision. In 1955, Mr. Collins was transferred to the Noblesville, Ind. strawboard mill and placed in charge of waste paper and straw purchasing and of the pulping operation. Late in 1955, Collins was appointed plant manager of the Noblesville mill.

Raymond M. McDaniel succeeds Mr. Collins as plant manager at the Noblesville strawboard mill. He joined Container Corp. in 1933. He held several positions at the Carthage, Ind., strawboard mill including tour foreman and assistant superintendent. In December 1953, Mr. McDaniel was appointed mill superintendent at Carthage.

William Lough

Eastex Sales Department Shifts

William Lough, former eastern sales representative for East Texas Pulp and Paper Co., has been appointed western sales manager and will be located in Chicago. He will be assisted by Paul K. Brownell.

Robert Long, formerly with J & J Rogers, will replace Mr. Lough in the New York office, which is headed by George Roschek, eastern sales manager.

Loren V. Forman

Named Scott W. Coast Manager

Loren V. Forman has been appointed general manager of all Scott Paper Co.'s West Coast manufacturing and timber operations.

He has been general manager of the company's Everett, Wash. plant since 1956. Mr. Forman received his Ph.D. from the Institute of Paper Chemistry, Appleton, Wis. Following several assignments at Scott's Chester, Pa., plant he was named staff technical director at Everett in 1953.

He replaces Charles D. Dickey Jr., who has been elected president of British Columbia Forest Products Ltd., Vancouver, B. C.

J. Bicknell Lockhart

Riegel Elects Vice President

Riegel Paper Corp. has announced the election of J. Bicknell Lockhart as a vice president. He will continue as manager of merchant and industrial sales. Frederick M. Jennings, now assistant secretary, has been elected to Mr. Lockhart's former position as secretary of the company.

Mr. Lockhart joined Riegel in 1948 as an industrial engineer and purchasing agent at their New Jersey mills. In 1952 he was made manager of the Riegelsville, Hughesville, and Warren Glen mills and was later transferred to the New York office as manager of merchant and industrial sales. He was elected as a director of the corporation in 1953, and secretary in 1955.

Named Supt. of River Raisin Plant

Eugene E. Loughridge has been appointed general superintendent of the Monroe, Mich. corrugated plant, River Raisin Paper Co.

Mr. Loughridge comes to Monroe from Atlanta, Ga., where he was a general superintendent of the National Container Corp. plant. Prior to that assignment he was superintendent of the Madison, Ill. plant of the same company.

Carruth Advanced by Intl. Packings

William G. Carruth, former office manager for Paper Craft Products, Worcester, Mass., has been named manager of customer service for the International Packings Corp. in Bristol, N. H. He came to International Packing as sales correspondent in 1950, and was named assistant sales manager in 1954.

Meagher Retires

Charles F. Meagher has retired as mill superintendent of Fibreboard Paper Products Corp. at Port Angeles, Wash.

Wertheimer Elected Thilmany Director

The directors of the Thilmany Pulp & Paper Co. announced recently that R. E. Wertheimer, Longview, Wash., has been elected a director of the firm. He fills the vacancy created by the death of his father, Robert S. Wertheimer.

The new director, whose grandfather was one of the principal organizers of the Thilmany Co., is associated with the Longview Fibre Co., and is also a director of that concern.

Southern Representative for K-C

The appointment of M. L. Hunt as southern district representative, Industrial and Specialty Sales division, has been announced by Kimberly-Clark Corp. He succeeds the late G. L. DuBois, who died December 8. Mr. Hunt now is sales manager of the Coosa River Newsprint Co., and will continue in that capacity.

Fibreboard Corp. Appoints Two

Two appointments in the research and development department of Fibreboard Paper Products Corp. have been announced. A. C. Dreshfield Jr. and W. A. Sandholtz were named group leaders for the company's continuing scientific research in the manufacture of all varieties of cartons and shipping containers.

Mr. Dreshfield will supervise the work of the paperboard group, in raw materials, pulping and paperboard manufacture. Before his appointment with Fibreboard, he was a senior project engineer with Scott Paper Co. at Chester, Pa.

Mr. Sandholtz will establish a program with a new products group. For the past two years he has been a development engineer for the new products division of Minnesota Mining and Manufacturing Co.

Abitibi Appointments

Abitibi Power & Paper Co. Ltd., announced the following appointments: Ernest W. McBride, vice president (manufacturing); Robert E. Costello, manager of manufacturing (pulp and board); Ralph E. Hayes, manager of manufacturing (newsprint). Since 1956 Mr. McBride has been manager of all newsprint, fine paper and pulp and board mills. Mr. Costello and Mr. Hayes have been assistant managers of pulp and board, and newsprint mills for the same period.

Frederick W. Bradshaw

Consolidated Elects Top Officers

Following the December meeting of the directors of the Consolidated Paper Corp. Ltd., the election was announced of Frederick W. Bradshaw as vice president and executive assistant to the president. Mr. Bradshaw has 23 years service with the corporation and has served as chief engineer, division manager and manager of manufacturing.

The election was also announced of D. Lloyd Adams, as vice president and treasurer and of Albert F. Gurr, as vice president and comptroller replacing George Henderson who will continue as vice president in an adminstrative capacity. Mr. Adams has had 39 years, service with the corporation and a predecessor company as treasurer. Mr. Gurr has had 35 years service and was appointed assistant comptroller in 1953.

Consolidated Paper Sales, Ltd., announce the appointment of John D. Andrew as assistant to the vice president and manager, Wayagamack sales. For the last eight years he has been employed by the Canadian Pulp & Paper Assn. as market analyst, statistician and latterly as secretary-manager of various trade sections.

O'Brien Joins Riegel

Gerald A. O'Brien has joined Riegel Paper Corp. at its Carolina Division where he will be mechanical engineer for the bleached board paper mill now under construction. He was previously with Anglo Paper Products Ltd. of Canada where he was research and development engineer.

Ristow Advanced

Leslie Ristow has been appointed the assistant sanitation and maintenance foreman at the Wisconsin Rapids Division of Consolidated Water Power & Paper Co. He has worked in this department since he joined the company in 1933.

Staff Changes at New York & Penn

Herbert C. Church, general superintendent of the Lock Haven Div., New York & Pennsylvania Co., has been assigned to a new position, director of process and product development.

Thomas G. Williams, superintendent of the Lock Haven mill has been made general superintendent of the Lock Haven division to replace Mr. Church, and Herman Uebel was promoted to Mr. Williams' post as superintendent of the Lock Haven mill.

Charles M. Flaig, paper mill general foreman, replaces Mr. Uebel as paper mill superintendent of the Lock Haven mill and H. D. Floruss, paper tour foreman, fills the vacancy created by Mr. Flaig.

Emil Colquist has retired as superintendent of the New York & Penn's Castanea mill. Walter L. Grimm, assistant superintendent of the Castanea mill replaced Mr. Colquist, and Ellis Bottorf, assistant mill supervisor of the Castanea mill became assistant superintendent.

Georgia Pacific Personnel Announced

The following appointments have been announced for the Georgia Pacific Paper Co. mill by W. J. Shelton, vice president and manager: E. E. Archibald Jr., general superintendent; Edmund Ericksen, assistant to the manager; Roy W. Wiberg, technical superintendent; Harold Bancroft Jr., purchasing agent; Robert A. Nelson, receiving and stores supervisor; and James D. Tough, personnel supervisor.

William E. Ross, pulp mill superintendent; James E. Esselman, Clayton L. Mitchell, E. E. Switzer, pulp mill shift foremen; W. H. Youngchild, paper mill superintendent; George W. Johnson, Edward E. Roberts, Arthur H. Ferenz, paper mill shift foremen; A. D. Anderson, plant engineer; Paul A. Logan, electrical superintendent; Harold Gillaspie, mechanical superintendent; Willis D. Fry, mechanical foreman; Arthur H. Jones, controller; and Richard Bertran, chief accountant.

New Salesmen for Continental Can

Dean P. Stout, general manager of sales for the Gair Containerboard & Kraft Paper Div. of Continental Can Co., has announced the appointment of Robert Pollard as manager of container-board sales and J. T. Hansen as Philadelphia district sales manager for the Southern Advance Bag operation of the company.

NEW LITERATURE

APPLETON WINDERS. (8p Brochure) Lists all standard available combinations for their two drum winder and rewinder. Also explains many combinations of custom-built winders which can be obtained by interchanging the various components. **Appleton Machine Co.**, Appleton, Wis.

CLAMCO PRODUCTS. (Catalogue) Covers new products as well as complete line of Clamco products. Also illustrates heat sealing equipment, prepackaging tables and packaging accessories. **Cleveland Lathe & Machine Co.**, 5400 Brookpark Rd., Cleveland 29, Ohio.

CONE-DRIVE STANDARD GEAR SETS. (Bulletin CD-700-C) Contains specification drawings for all worms and gears, tool charts and horsepower ratings for hundreds of special gearset combinations, backlash tolerances, lubrication data and service factors. **Cone-Drive Gears, Div. Michigan Tool Co.**, 7171 E. McNichols Rd., Detroit 12, Mich.

GRIT COLLECTING AND GRIT WASHING EQUIPMENT. (Book 2571) Provides design data on seven types of grit collectors, two grit washers, and the Tritor screen which is a combination grit collector and mechanical screen. **Link-Belt Co., Dept. PR,** Prudential Plaza, Chicago 1, Ill.

LeTOURNEAU TRANSPORTER AND LOGGING TRANSPORTER SERIES T. (Bulletins 301-T1 and 120) Cover operating features, construction etc. on these transporters. **R. G. LeTourneau, Inc.**, 2399 S. MacArthur St., Longview, Tex.

MULTI-STAGE HORIZONTALLY SPLIT CENTRIFUGAL PUMPS. (Form 7148-A) Includes cross-sectional views and a complete table of heavy duty pump dimensions. **Ingersoll-Rand,** 11 Broadway, New York 4, N. Y.

MACBETH-ANSCO DENSITOMETER. (Bulletin) Contains illustrated sales copy on their Model 12-A. **Macbeth Corp., Dept. P. 10,** Newburgh, N. Y.

OPERATING YOUR SPACEMASTER FORK TRUCK. (Booklet) Offers tips on operating fork trucks more safely. This booklet is illustrated with a series of cartoon-type drawings and will serve as a guide in setting up a fork truck drive training course. **Lewis-Shepard Products, Inc., Dept. R-23,** 125 Walnut St., Watertown 72, Mass.

PICCO RESINS. (12p Brochure) Includes charts which show physical and chemical data, melt viscosities, compatibilities, and solubilities of coumarone-indene resins, modified styrene resins, and plasticizers. **Pennsylvania Industrial Chemical Corp.**, Clairton, Pa.

PYREX BRAND "DOUBLE TOUGH" GLASS PIPE AND FITTINGS. (Manual) Provides information for design, engineering and installation. **Corning Glass Works,** Corning, N. Y.

PERTINENT FACTS ON MATERIALS HANDLING. (Folder) Contains a personal message from C. E. Smith, President of Towmotor regarding economies to be realized from improved materials handling procedures. **Towmotor Corp.**, 1226 E. 152nd St., Cleveland 10, Ohio.

SPROUT-WALDRON VARIABLE SPEED UNIFLOW FEEDER. (Bulletin 187) Describes this feeder which has a specially designed combination screw and paddle conveyor arrangement resulting in uniform continuous and controlled feeding to the refiner. Also covers their bent leg magnet chute. **Sprout-Waldron & Co., Inc.**, 130 Logan St., Muncy, Pa.

TRANSPORTER STACKER LINE. (Bulletins 1005W, 1006W, 1007W) Contain complete sales drawings, specifications and detailed descriptions of three models, WST-20, WST-25 and WST-30 respectively. **Automatic Transportation Co.**, 101 W. 87th St., Chicago 20, Ill.

THIS SEAL IS IMPORTANT TO YOU. (Bulletin 152-57) Outlines details of AMCA program which helps users of air moving equipment to quickly identify equipment certified to perform according to published ratings based on official tests. **Air Moving & Conditioning Assn.**, 2159 Guardian Bldg., Detroit 26, Mich.

WEATHER-PROTECTED MOTORS. (Bulletin O5B7874C) Gives construction and mechanical features of these motors which are available in all commonly used ratings, both horizontal and vertical. **Allis-Chalmers Mfg. Co.**, Milwaukee 1, Wis.

STOCK PROPORTIONER. (Bulletin 191) Describes the Sprout-Waldron/Cowan stock proportioner which is designed for uniform, accurate volumetric metering of pulps. **Sprout, Waldron & Co., Inc.**, 130 Logan St., Muncy, Pa.

SIGNODE MODEL PSF-1. (4p Folder) Uses schematic drawings to describe and illustrate how the Signode Power Strap answers the problem of feeding vertical straps around large packages or skid loads. **Signode Steel Strapping Co.**, 2600 North Western Ave., Chicago 47, Ill.

SPROUT-WALDRON/ANDERSON FIBERPRESS. (Bulletin 190) Includes technical data, engineering drawings, and product as well as installation photos. **Sprout, Waldron & Co., Inc.**, 130 logan St., Muncy, Pa.

VERSATROL. (Bulletin 106) Explains applications of the most common Versatrol circuits, both automatic and limit, including the new Load Sentry overload control. These are suitable for use with virtually any detectable variable. **Assembly Products, Inc.**, 75 Wilson Mills Rd., Chesterland, Ohio.

PRIVATE EYE FOR THE PAPER INDUSTRY. (House Organ) Describes the Viking electronic void indicator which is used for automatic detection of holes and defects in the production of paper, plastics, rubber, etc. **M. W. Jenkins' Sons, Inc.**, Cedar Grove, N. J.

ROSS TYPE BCF EXCHANGERS. (Bulletin 1.1K6) Contains details of their recently expanded line, performance improvements and new design features of the 1958 type BCF exchangers. **Ross Heat Exchanger Div. of American Standard,** Buffalo 5, N. Y.

RELIANCE VSMR MILL REGULATOR. (Bulletin K-2503) Includes photos and drawings. Also explains how in the event of tube failure in one half of the panel the other half instantly and automatically carries the entire load. **Reliance Electric & Engineering Co.**, 24701 Euclid Ave., Cleveland 17, Ohio.

SERIES YC ELECTRIC LOGGING ARCH. (Bulletin 101) Presents detailed information on the improved Series YC Electric Logging Arch. Also includes specifications and operational information. **R. G. LeTourneau, Inc.**, 2399 S. MacArthur St., Longview, Tex.

SEAL-O-MATIC TAPE DISPENSERS AND LABEL MOISTENERS. (Folder) Contains illustrated sales copy on tape dispensers, label moisteners, carton openers and safety knives in addition to other shipping and office room equipment. **Seal-O-Matic Dispenser Corp.**, 169 Murray St., Newark 5, N. J.

Statistics of Paper 1957 Soon Available

The phenomenal growth of the pulp and paper industry during the first half of the twentieth century is summed up statistically in the new American Paper and Pulp Association's 75-page report "Statistics of Paper—1957."

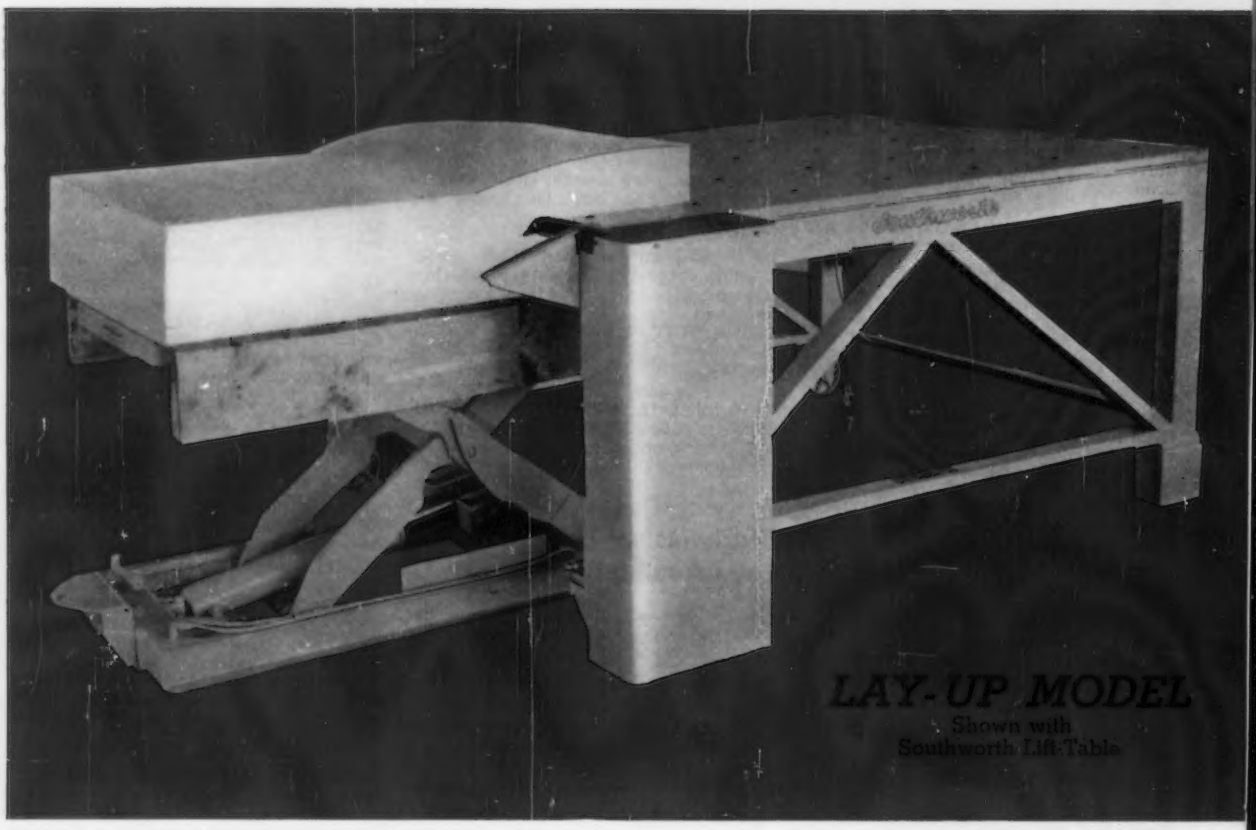
Soon to be published, this report shows that the paper industry has grown at a faster rate than the population as demonstrated by the per capita paper and paperboard consumption increase of 7½ times since 1899.

Further evidence of paper's exceptional expansion in the years from 1899 to 1957 is that:

—Consumption of pulpwood has increased 18 times,
—Production of wood pulp has increased 19 times,
—Production of paper and board has increased 15 times,
—Exports of paper, board and paper products have increased 36 times.

Advance orders for "Statistics of Paper—1957" are now being taken by the American Paper and Pulp Association, 122 East 42nd St., New York 17, N. Y. Price per copy is $10.00.

MORE TPH* WITH SOUTHWORTH'S NEW



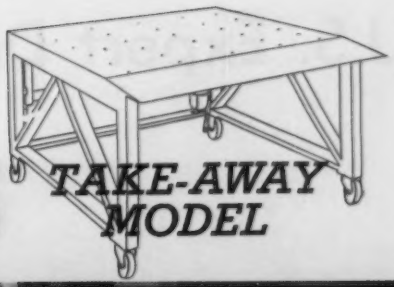
minimum capital investment, per pair, pays off in maximum trimmer production engineered to prevent idle time, eliminate manual lifting, conserve floor space 1,000 lb. capacity, sheet size 52 x 76 — air film buoyancy protects sensitive stock

TONS PER HOUR* is the one way of rating the efficiency of a mill trimming operation. As trimming cost represents a major portion of overall manufacturing costs, any savings at this stage may reflect directly on the profit picture. But even with the latest model trimmers, a good TPH depends to a great extent on the human factor . . . the speed of de-skidding, feeding, unloading and re-skidding. At least, that *has* been the case!

To improve this speed, by reducing manual handling to a minimum, Southworth research produced this pair of Straddle Transfer Tables. The Lay-up Table literally *loads itself* as it straddles the skid of untrimmed sheets. The air-cushioned trimmer load is then carried by the Table to the trimmer and presented for feeding with no strain or exertion on the part of the operator. The Take-away Table reverses this procedure, carrying the trimmed stack on for quicker and easier re-skidding.

Better distribution of the work load between the three operators insures *full time operation of the trimmer.* The low initial cost of a Southworth Straddle Table installation, therefore, is soon recovered in the combined savings made possible by a more efficient and effective finishing room . . . for as TPH increases, production costs decrease.

STRADDLE TABLES



TAKE-AWAY MODEL

Installation at Allied Paper Company, King Division, Kalamazoo, Michigan, showing typical layout of a three-man operation with a pair of remote control Tables servicing an 85 inch mill-trimmer. Note:

1 Simplified and direct flow of stock to trimmer. Operator at right de-skids untrimmed stock. Lay-up Table makes rapid traverse and presents load to inventory table. Upon completion of trim, Take-away Table brings stock to operator at left who stacks up skid load ready to wrap and ship. Tables have *no* hampering superstructures.

2 Elimination of manual lifting and reduction in stock manipulation. Trimmer operator is responsible only for trimming stock. As another load is always waiting, there is no costly idle time on this equipment. In fact, production can actually be predicted in terms of knife cuts per hour!

3 Production costs decrease as production rate increases. Depending upon sheet size, basis weight and number of cuts per sheet, the handling of full trimmer loads, full time, can result in production increases to as much as 5 tons per hour over a former average of 2 tons . . . lowering cost considerably.

4 Trimmer accessories planned for trimmer layout. Here the installation meets requirements of existing recessed lifts. Tables are equally suitable in surface lift layouts or with more efficient Southworth Lift Tables, stationary or portable.

For Further Details Write:

SOUTHWORTH MACHINE CO. since 1890

SOUTHWORTH MACHINE CO.

77 WARREN AVENUE
PORTLAND, MAINE

U.S. Expert Describes Italy's First Semichemical Mill

R. E. Collins
Pulp Mill Supt. Mill #2
Crossett Paper Mills, Crossett, Ark.

Italy is a wood poor country whose only domestic commercial wood is a limited supply of poplar which is used by the Italian pulp and paper industry for mechanical pulp. Chemical pulp requirements are met by importing chemical pulps, or by pulping imported wood. Both methods result in high chemical pulp costs. Therefore, the story of SAFFA's new mill that is producing paper and board incorporating large percentages of bleached semichemical pulp made from local poplar veneer waste should be of interest to everyone.

The company's veneering operation at Magenta results in large quantities of veneer waste, cores and reject logs which previously were burned as fuel. This was uneconomical and poor conservation practice for a wood poor country. The development of semichemical pulping in the United States provided a means of utilizing this waste wood. After careful study of semichemical pulping SAFFA decided to proceed with plans for a mill.

Design and Construction

When design of the mill started in 1951 there was still considerable uncertainty as to the utilization of semichemical pulp, there were no mills pulping veneer waste and SAFFA desired maximum flexibility as to paper grades produced. Therefore, it was decided design should provide for these primary considerations.

1—The pulp mill would be capable of pulping veneer waste and/or straw.

2—Space for a future bleach plant would be provided.

3—Market pulp would be sold.

4—The machine would have maximum flexibility in paper grades.

5—The mill capacity would satisfy SAFFA's paper requirements and provide market paper.

6—The mill could be expanded as conditions allowed.

With these factors in mind, the pulp mill was designed to produce 30 tons a day of unbleached semichemical pulp or 20 tons a day of single stage bleached straw pulp. The paper mill was designed to have a duplex fourdrinier machine with a capacity of 50 tons a day of duplex or single ply MF, MG and supercalendered paper and board having a furnish ranging from 100 per cent waste paper to 100 per cent chemical and semichemical pulps.

The mill was engineered and built entirely by SAFFA personnel. The mill is located to one side of the veneer factory so that unrestricted expansion is possible. The installation consists of a group of seven white buildings constructed of reinforced concrete. The buildings are:

Wood Room
Pulp Mill and Bleach Plant
Pulping Chemicals Building
Bleaching Chemicals Building
Paper Mill
Warehouse and Finishing
Powerhouse

Construction started in April 1952. The pulp mill started production of market straw pulp in May 1954. The paper mill and semichemical pulping were started in September 1954. The semichemical pulp was so superior to straw pulp that straw pulping was abandoned. The bleach plant went into operation in June 1957. This is the first bleached semichemical mill in Italy and as far as known, the first in Europe. SAFFA is justifiably proud of this mill which is exceptionally well designed and has welcomed interested visitors from all parts of the world.

Wood Room

Veneer waste, cores and reject logs are delivered from the plywood mill and are either stacked by hand in separate piles in the wood yard, or delivered directly to the chipping operation. Since veneer chips penetrate and cook differently than log and core chips, veneer is chipped and cooked separately.

Veneer is chipped in a feeder and chipper designed and built by SAFFA specifically for veneer waste. The chipper consists of a 24-inch wide, 18-inch

About SAFFA

The Societa per Azioni Fabbriche Fiammiferi Ed Affini, more familiarly known as SAFFA, is a large, progressive, well diversified Italian firm with nine plants in Italy and several others located throughout the world. The largest SAFFA plant is at Magenta, Italy, a town of 8,000 located 17 miles west of Milan. The plant employs 2200 people including 400 women. This factory produces matches, ice cream sticks, and other poplar veneer products; furniture; plywood; "Populit," a shredded wood and concrete insulating board; "Carbion," a corrugated board with two-way stretch; and, of most interest to the pulp and paper industry, paper, board and "Saffacel," bleached semichemical pulp.

Pietro Molla, general manager of the Magenta plant, conceived the original idea of a pulp and paper mill, and was enthusiastically supported and encouraged by Temistocle Lazzari, vice president and general manager. SAFFA President Rusconi Clerici approved the plan and obtained the consent of the board of directors. Aldo Corvaia was appointed manager of the pulp and paper mill and to direct its planning, engineering, construction and operation. Mr. Corvaia was assisted by Antonio Weickert, paper mill superintendent and Doctor Renzo Rabbi, technical director and pulp mill superintendent.

Mr. Collins, the author, met Mr. Corvaia in the United States while he was making an extensive tour of semichemical mills. The outcome of this meeting was an invitation to come to Italy in 1954 to start up the semichemical mill. Operations were successful and Mr. Collins was asked to help in the design and start-up of the bleach plant which was put into operation in June 1957.

diameter six-knife cutter fed by two pairs of toothed feeder rolls designed to grip and positively feed uneven piles of veneer into the cutter. The feeder rolls are driven through a forward, reverse, neutral transmission which is driven off the cutter drive shaft through a pinion gear. Cutter and transmission are driven by a 50 h.p. motor. A belt conveyor carries the chips from the cutter to the chip screen.

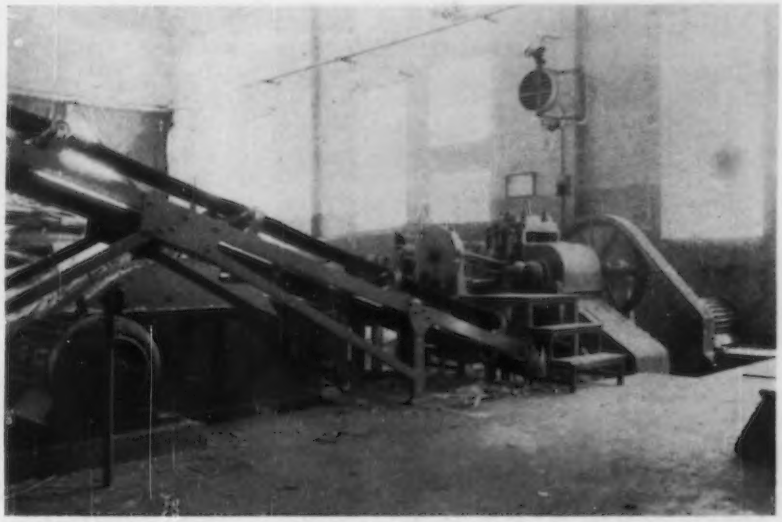
Logs and cores are hand fed to an H. Wigger, 69-inch diameter, four-knife chipper driven at 200 r.p.m. by a 60 h.p. motor. The chips are blown by fins mounted on the chipper disc to a cyclone discharging to the chip screen.

Chips from both chippers are screened on a Bezner vibrating screen driven by a 14 h.p. motor. Oversize chips are screened out on a one-inch mesh screen, the sawdust is separated from the accepted chips by a ⅛-inch mesh screen. Oversize chips are rechipped in a 15 h.p. Wigger hammermill. Hammermilled chips are blown back to the chip cyclone feeding the screen by a chip blower. A Redler conveyor carries screened chips to the chip bins over the digesters.

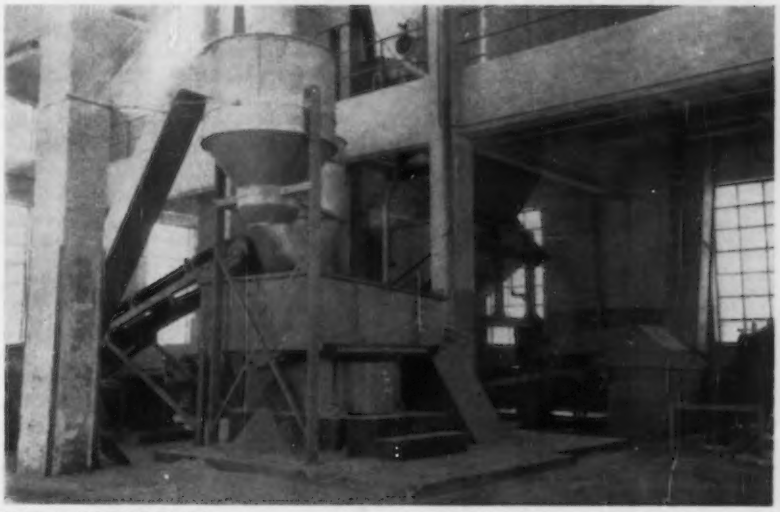
Pulp Mill

Four rectangular, flat bottomed, concrete chip bins of 1600 cubic feet capacity each are located above the digesters. The bins were designed primarily to handle straw and veneer chips which have poor flow characteristics. Drag conveyors, which drag the entire bottom of the bins, discharge the chips onto a belt conveyor running along the front of the bins. This discharges into a chute to a 20-inch diameter reversible screw conveyor which empties into either of the two digesters. Dry sodium sulphite and sodium carbonate are charged from 100-pound bags into the screw feeder during filling.

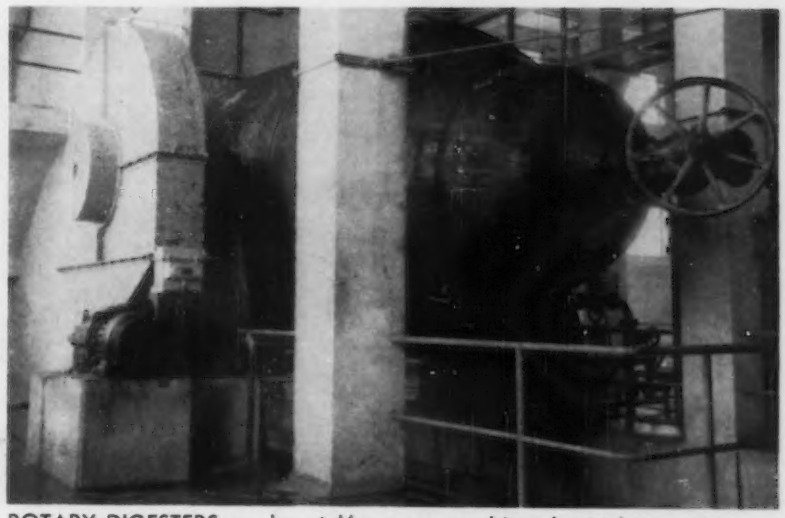
The two Voith, mild steel, rotary digesters are 8.4 feet in diameter by 24.6 feet high and have a capacity of 1130 cubic feet. Each digester has a 60° cone bottom terminating in an 8-inch manual valve and flanged discharge. The cones have counterweights to provide static balance. The digesters are rotated at ¼ r.p.m. by 14 h.p. motors through Luigi Pomini right angle speed reducers equipped with magnetic brakes. A loading platform which is attached to and rotates with the digester is level with the charging floor when the digester is in the upright position. Digester covers and chip loading chutes are handled by wall-mounted swing arms that rotate on ball bearings. Digester corrosion has been a problem. Lining with stainless steel proved unsatisfactory due to stress cracking at the plug welds so metallizing with stainless steel will be tried.



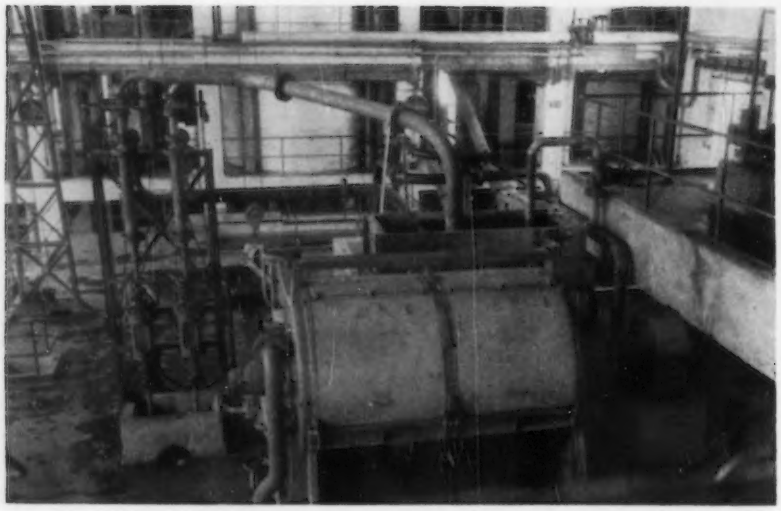
CUTTER AND CHIPPER are designed specifically for veneer waste.



VIBRATING SCREEN removes oversize chips and sawdust.



ROTARY DIGESTERS revolve at ¼ r.p.m., are driven by 14 h.p. motors.



ROTARY SCREEN and Vorjects eliminate undesirable material after refining.

Steam, digester dilution and relief are provided for by an internal strainer with ⅛-inch holes on ⅜-inch centers in the top of the digester and an internal three-inch line terminating at the non-driven journal. External steam, liquor and relief lines are connected to the journal by means of a tight slip joint and packing gland which are lubricated with black liquor. Cooking is manually controlled, but Minneapolis-Honeywell controls for complete automation of steaming and relief are being installed.

To blow, the digester is stopped in the upright position with the nozzle of the cone directly over an 8-inch hydraulic Paul blow valve connected to an 8-inch blow line. A slip joint connects the bottom flange of the digester to the blow valve. The slip joint is provided with limit switches so that the digester cannot be rotated while the sleeve is in the raised position.

Cooking Data

Charging time	20 minutes
Wood charge, O. D. lbs.	
Veneer chips	8,350
Log chips	9,450
Chemical charge, lbs.	
Na_2SO_3	1,980
Na_2CO_3	220
Liquor ratio	2 to 1
Pulp blown, O. D. lbs.	
Veneer chips	5,500
Log chips	6,150
Blowing time	2½ minutes
Unbleached permanganate number (TAPPI, RC-256)	
Veneer pulp	54
Log pulp	72
Cooking Schedule	
Time to 170°C, hours	2
Time at 170°C, hours	2

Cooked chips are blown into a cone bottom blow tank 13 feet in diameter by 36 feet high of 3500 cubic feet capacity. Agitation is provided by a locally built, adjustable pitch, wooden blade, arm type agitator driven at 32 r.p.m. through a speed reducer and 50 h.p. motor. Two diametrically opposite vertical rows of bulls-eye sight glasses spaced at about five-foot centers the full height of the blow tank provide visual observation of blow tank level and consistency. Black liquor dilution is provided for by a dilution ring in the bottom cone and at the suction of the chip pump. Blow steam is recovered in a Voith spray type contact condenser. The hot water is used for digester dilution and wash water.

The chips are pumped to the refiner installation through a circulation line discharging back into the cone of the blow tank by a 1050 g.p.m. 83 feet head Allis-Chalmers pump driven by a 75 h.p. motor. A 10 x 14 inch Sprout-Waldron rotary valve meters the chips to a Sprout-Waldron #24 drainer and 300 h.p. Sprout-Waldron 36-2 refiner. The refined pulp is diluted to 3½ per cent and discharged into a three-ton storage chest equipped with a propeller type Voith agitator driven by a 20 h.p. motor.

The refined pulp is screened through a Voith knotter with 0.118-inch perforations, cleaned in two Vorjects in parallel then screened in a RS-4D Biffor rotary screen with 0.031-inch primary screens and 0.027-inch secondary screens. Knotter and rotary screen rejects are returned to the blow tank for further refining, Vorject rejects are sewered. The screened pulp is pumped from a small surge chest to a three-stage installation of 83 Bauer #600 cleaners having ⅛-inch discharge tips. The primary stage has 70 cleaners, the secondary, ten and the tertiary, three. Secondary accepts are returned to the primary feed, tertiary accepts to the secondary. Rejects from the tertiary stage are sewered.

The cleaned pulp is washed on a Voith two stage washer installation consisting of a five-foot diameter by 8½-foot decker and a 5¾-foot diameter by 8½-foot vacuum washer. Washed pulp is diluted to 3½ per cent by fresh water and sluiced to the 6½ ton machine chest, or the three-ton bleach plant storage chest. Washing after screening is unsatisfactory due to loss of black liquor and foaming. Plans are to install a Sprout-Waldron, Anderson press and refiner installation.

CHLORINATION WASHER is enclosed in wooden hood with plexiglass sides.

Bleach Plant

Pertinent details of the 50-ton three-stage Kamyr bleach plant are listed in Table 1.

Pulp is washed after each stage on 5 foot 9 inch diameter by 7½-foot wide vacuum washers all having tile vats. Process piping is either rubber lined, lead or stainless steel. The chlorination washer is completely enclosed in a wooden hood with plexiglass sides. The chlorination tower and washer hood are vented by means of a PVC exhaust fan and rubber lined piping which discharges the vented gas into an absorption tower in the bleach liquor-making system where it is absorbed in weak lime solution. The chlorination and caustic washers are fitted with rubber covered, air operated press rolls. The majority of bleach plant instrumentation is by Minneapolis-Honeywell.

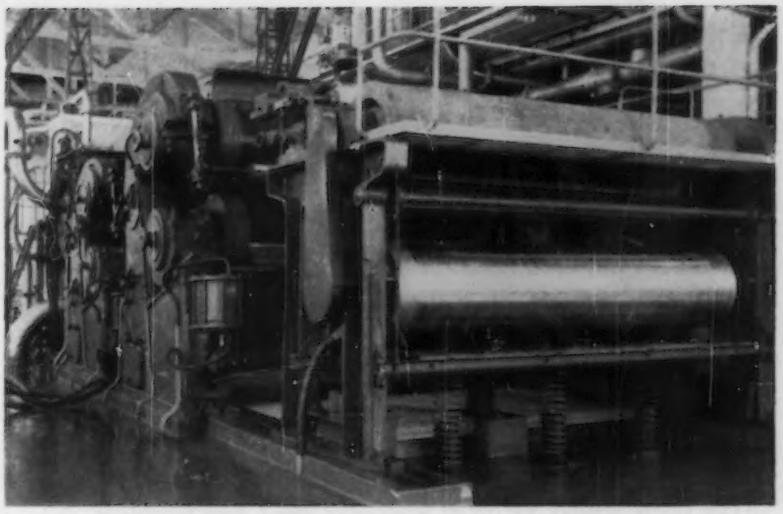
Unbleached pulp flow to the bleach plant is controlled by a Kallé consistency regulator and Foxboro magnetic flow meter. Operation of the first two stages is conventional. The hypochlorite stage is somewhat unusual in that two separate towers are used. Pulp off the caustic washer is diluted to seven per cent and falls into the suction of a horizontal Kamyr centrifugal pump which pumps the pulp into the bottom of the first hypochlorite tower. The pulp is discharged from the top of the tower by a rotary plow into a stainless steel 16-inch diameter screw conveyor which conveys the pulp to the top of the second hypochlorite tower. Additional bleach liquor and caustic can be added in the screw conveyor. The fully bleached pulp is diluted in the bottom of the second tower and pumped to the washer. The pulp is diluted off the washer to three per cent and pumped by a second horizontal Kamyr pump to the Kamyr wet machine chest.

Kamyr Wet Machine

Unbleached or bleached pulp is lapped for storage or sale on a 94-inch Kamyr wet machine. The machine has a 6½-feet diameter forming cylinder with a 13-inch diameter wire covered extraction roll, an 18-inch diameter grooved rubber and a 19-inch diameter smooth rubber covered press rolls. The press section has two presses, the first press rolls are grooved steel rolls 28 inches in diameter, the second press has 31-inch diameter smooth steel press rolls. Pressure is controlled by air operated cylinders. The press is followed by a slitter and cutter and layboy off which the laps are hand loaded onto skids. A K-6 Nash Hytor vacuum pump driven by a 45 h.p. motor maintains 10 inches of vacuum in the forming cylinder. The machine is driven off a line shaft through cone pulley sectional drives.

Cooking Chemicals

A very versatile plant for preparation of cooking liquor is being constructed.



WET MACHINE, 94 inches wide, laps pulp for storage or sale.

The sodium sulphite, sodium carbonate cooking solution will be prepared from purchased sodium sulphite and sodium carbonate, or by sulphiting a carbonate solution with sulphur dioxide resulting from the burning of either sulphur or iron pyrites. This versatility will allow SAFFA to take advantage of fluctuating raw material costs and availability.

Major equipment consists of an air unloading system for dry sodium sulphite and sodium carbonate, a cyclone separator discharging to a dissolving tank, two solution storage tanks, two cooking liquor storage tanks, four sulphiting tanks, a packed sulphiting tower, a rotary sulphur burner and combustion chamber, a seven-tray pyrites burner and cyclone ash separator, a scrubbing tower to remove sulphur trioxide from the SO_2 gas, an indirect gas cooler and a gas blower to furnish induced draft for the burners and forced draft to the absorption tower.

Bleaching Chemicals

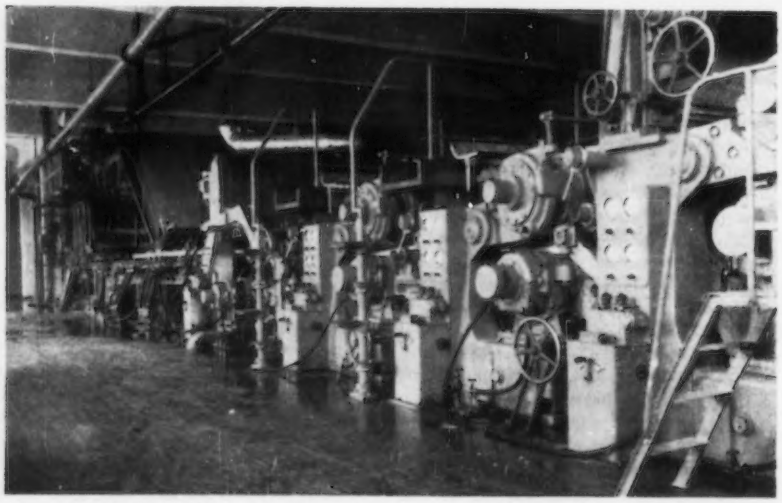
Chlorine storage and a calcium hypochlorite bleach making installation are located in the Bleaching Chemicals Building. A Worthington air compressor and Pittsburgh electro-drier system supplies dry air at 140 p.s.i.g. for unloading liquid chlorine into two 40-ton liquid chlorine storage tanks. The bleach liquor-making system consists of a screw conveyor and bucket elevator for unloading hydrated lime from hopper cars; two 900-cubic feet, cone bottom, dry lime storage silos with rotary air lock dischargers; an air conveyor system to convey lime to a 250 cubic feet measuring hopper and two 26,400-gallon, agitated, concrete bleach making tanks equipped with lead liquid chlorine charging nozzles and finished liquor siphoning pipes. The 30 g.p.l. bleach liquor is pumped to two 16,000-gallon storage tanks in the bleach plant. Dregs are washed in an agitated 17,000-gallon concrete washing tank. The resulting weak lime solution is circulated through a packed tower to absorb chlorine gas vented from the chlorination stage and from chlorine cars and storage tanks. The weak bleach liquor is used for dissolving fresh lime.

Liquid chlorine is vaporized in a hot water vaporizer in the bleach plant and metered to the chlorination tower through a pressure regulating valve and chlorine rotameter. Ten per cent caustic is stored in a 1300-gallon storage tank in the bleach plant. Caustic and bleach liquor are pumped to stainless steel head boxes that maintain constant heads

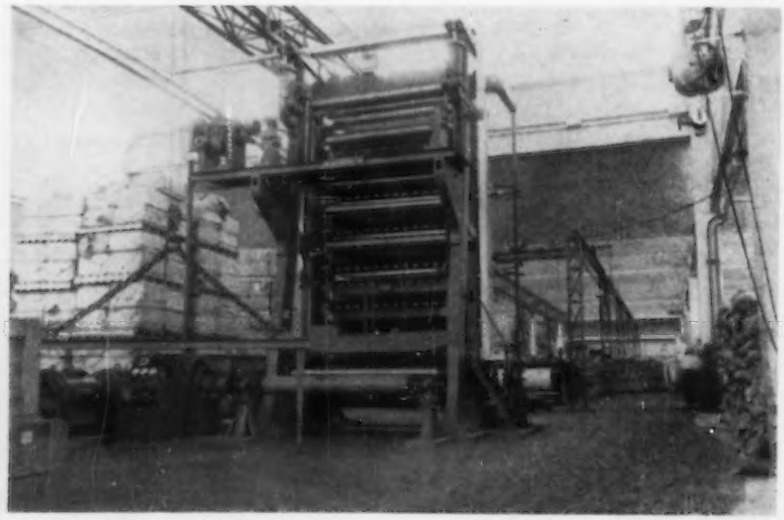
TABLE I—BLEACH PLANT DATA

Item	Chlorination	Caustic Extraction	1st Hypo-chlorite	2nd Hypo-chlorite
Tower construction	Acid resistant tile	Mild steel	Tile	Tile
Tower size, feet				
Diameter	9' 2"	7' 2"	10' 10"	10' 10"
Height	31'	24' 4"	31' 2"	26' 4"
Direction of flow	up flow	down flow	up flow	down flow
% Consistency	3	15	7	7
Retention time, hours	1	1½	2	2
Temperature, °F	68	170	100	100

FILLER FOURDRINIER SECTION is mounted above liner fourdrinier.



LINER FOURDRINIER and press section showing felt from filler fourdrinier above.



SUPERCALENDER and finishing operations are housed in a separate building.

on the rotameters supplying caustic and bleach to the caustic and hypochlorite stages.

Steam, Power and Water

Two I. Simmon water wall gas fired boilers equipped with superheaters and rotary induced draft fan economizers produce 840°F. steam at 700 p.s.i.g. No. 1 boiler has a capacity of 28,600 pounds of steam per hour, No. 2 has a capacity of 44,000 pounds per hour for a total capacity of 72,600 pounds per hour.

1350 kilowatts of 50 cycle electricity is generated by two STAL (Svenska Turbinfabriks Artiebolaget Ljungstrom) turbines using 640-pound steam at 806°F. A type AM-26 generator operates at 1000 r.p.m. producing 350 kw. This generator exhausts at 170 p.s.i.g. back pressure to supply high pressure process steam. A type DDM-33 generator produces 1000 kw. at 3000 r.p.m. and exhausts at 45 p.s.i.g. to supply low pressure process steam.

Two 3200 g.p.m. wells supply mill water. One is 250 feet deep, the second is 510 feet deep. Water is pumped from the wells to either of two 31,000-gallon storage tanks, one located in the pulp mill, the other in the paper mill. The pulp mill tank supplies a pressure of 72 feet of water, the paper mill tank furnishes a head of 50 feet.

Stock Preparation

Fibrous furnish for the machine consists of purchased bleached and unbleached kraft and sulphite pulp, groundwood and wastepaper and bleached and unbleached semichemical pulp. The chemical and semichemical pulps are used in liner for duplex board, or for single ply board and paper. Filler stock consists entirely of groundwood and wastepaper. Indications are that at least 60 per cent of the purchased pulps will be replaced by semichemical pulp.

Groundwood and wastepaper are pulped and cleaned in an Apmew system consisting of a 740 cubic foot slush-pulper, a rotary screen with 0.118-inch slotted screen plates, a thickener and a small surge chest. The slush pulp is pumped to either of the two storage chests on the third floor where the consistency is increased to seven per cent for beating by extraction rolls. Slush semichemical pulp from the pulp mill is also stored and thickened in either of these chests. The six beaters are charged by gravity from either storage chest.

Kraft pulp, and occasionally waste paper, is disintegrated in a S. A. Vender kollergang. The kollergang has a 10-foot diameter pan, a 7-foot diameter bed stone and 5-foot 11-inch diameter by 1-foot 10-inch wide stone rolls driven at 10 r.p.m. by a 35 h.p. motor. Dis-

integrated pulp is hand fed to the beaters. Baled sulphite and lapped semi-chemical pulp are disintegrated in the beaters.

The six 1000-pound beaters have beater rolls 3-feet 3-inches in diameter by 6 feet 6 inches wide with 84 bars 0.315 inch wide and two bed plates, each with 15 bars 0.197 inch wide. The rolls are driven at 265 r.p.m. by 275 h.p. motors. The beaters are dumped to any of four beater chests. Clay and other nonfibrous fillers are added in the beaters; color, size and alum are added in the beater chests. Stock from the beater chests can be pumped to any of three machine chests, one for filler stock and the other two for liner stock to provide flexibility for order changes. Either of the two fourdriniers can be supplied by any of the machine chests.

Filler stock is pumped from the machine chest through two 80 h.p., 1450 r.p.m. Voith refiners with 0.138 inch bars in shell and plug which discharge into a sand riffler from which the stock flows to an H. Fink rotary screen with 0.0472 inch cut slotted screen plates then into the headbox of the filler fourdrinier. Liner stock is pumped to two 110 h.p., 1000 r.p.m. Jones refiners with 0.138 inch bars which discharge into a small dilution chest in which the liner stock is diluted to headbox consistency with machine white water. The fan pump pumps the diluted stock through six Vortraps followed by a Fink screen with 0.0315 inch cut plates then into the headbox of the liner fourdrinier.

Paper Machine

The 98-inch wide Voith duplex machine has one fourdrinier section conventional in location and a second fourdrinier section mounted directly above this, but reversed so that its direction of travel is toward the head box of the lower fourdrinier. The sheet leaves the couch roll of the upper fourdrinier, turns around a paper roll and is carried downward by a felt to join the sheet on the lower fourdrinier just before it goes under the dandy roll. The upper fourdrinier is used only to form the filler ply when making duplex board. The lower fourdrinier is used to form the liner ply on duplex board, or is used alone for single ply boards and papers. The two fourdriniers are compared in Table 2.

The press section consists of two straight presses and a reversing press. Bottom press rolls are rubber covered, the top rolls are stonite. The first press rolls are 19.8 inches in diameter, the bottom rolls of the second and reversing press are 21.7 inches in diameter, the top rolls are 21 inches in diameter.

The driers consist of a first section of eleven 59-inch diameter driers with two top felt and two bottom felt driers 49 inches in diameter, a second section with a 13-foot Yankee drier and a 59-inch felt drier and a third section of five 59-inch driers with one top felt and one bottom felt driers 49 inches in diameter. The driers are enclosed in a canopy hood designed by Ross Engineering Co. and built by SAFFA. Air for the drier distribution system is heated by drier condensate in a heat exchanger. Hood exhaust air is passed through a heat exchanger to heat building ventilating air. Paper drying is controlled by a Midwest Fulton condensate system.

TABLE 2—FOURDRINIER DETAILS

	Upper Fourdrinier	Lower Fourdrinier
Length, feet	36	36
Table rolls, number & diameter	32 rolls, 4½"	29 rolls, 4½"
Number of suction boxes	2	2
Rotobelt	none	one
Breast roll, diameter	16"	16"
Suction couch, diameter	31½"	31½"
Couch press, diameter	17¾"	17¾"
Dandy roll	none	one

The driers are followed by two 39-inch copper cooling rolls in which cooling water is circulated, a calender stack having an 8.7-inch king roll and four 6.3-inch intermediate rolls, a two-reel winder, a duplex cutter and slitter and a rewinder. Dry broke is repulped in an Apmew slush pulper and pumped back to the beater room slush pulper. The machine is driven up to 525 feet per minute through cone pulley sectional drives and a line shaft by a 295 h.p. d.c. motor. Speed is controlled by a Ward Leonard electronic regulator.

Laboratory

The completely equipped laboratory is made up of four departments, a chemical testing section, a pulp testing section, a constant humidity and temperature paper testing section and an experimental pulping section. Experimental pulping equipment includes a small Voith rotary digester, a Sprout-Waldron laboratory refiner and flat screen, a #600 Bauer cleaner and a Voith laboratory beater.

Finishing

A separate building houses the finishing and supercalendering operations, the paper mill offices and engineering department and provides warehousing space. Supercalendered paper is made on a 14-roll, 103-inch Maschinenfabrik Zum Bruderhaus supercalender. The stack is made up of a 24.4-inch king roll and a 20.5-inch queen roll of hardened cast iron, seven 17.7-inch intermediate paper rolls and five intermediate hardened cast iron rolls 14.2, 11 and 10.8 inches in diameter. The supercalender is driven up to 2000 feet per minute by a 310 h.p. d.c. motor and motor generator set. Supercalendered paper is slit and rewound on an adjacent slitter and rewinder. Finished paper is inspected and wrapped in a constant temperature and humidity finishing room.

LABORATORY EQUIPMENT includes small rotary digester, refiner and beater.

Groundwood Mill

White-Water Systems

Groundwood mill white-water because of its high fiber and heat content needs special attention in its handling and conservation.

Dr. K. H. Klemm

Manager, München Dachauer Papier Fabriken
Munich, Germany

English text by
G. P. Chinn

The pulp which comes from the coarse screens of the groundwood mill still includes numerous slivers and fiber bundles which are undesirable in the final product. To remove these, the groundwood is passed through the so-called "fine screens" at a relatively low (0.6-0.8%) consistency. A considerable quantity of dilution water is required and this must be taken away again, before further processing, by using thickeners or filters (when the pulp is used directly) or wet lap machines (when required for storage or shipment). The water may be considered as the "carrier" of the groundwood mill and, by way of the pumps and flumes, is used for transportation of the pulp to the individual stages of the stock system. Besides, and this is very often overlooked, the water is also the carrier of a considerable amount of heat which is generated during wood grinding. As this heat must be paid for by an equivalent power input, its use for maximum effect should be considered a primary objective. As often the methods for achieving this have not been too clearly understood, this subject has been discussed in some detail in the following under the heading "Heat Economy in Groundwood Mills".

The White-Water System

The importance of the white-water system in groundwood mills is mainly based on the fact that the water is a carrier of considerable amounts of heat. Therefore, with any quantity of water delivered to the sewers, not only fiber losses but also heat losses occur. From the viewpoint of the high cost of this heat and its importance during groundwood production, it would, perhaps, really be preferable to discuss the "heat system" instead of the "water system" in groundwood mills. In any event, the heat generated during groundwood production, on the average around 2.5 million B.t.u./ton (o.d.) or equivalent to about 2300 pounds of steam,[1] has been obtained at a considerable power cost and, therefore, represents an important economic factor.

Water Consumption

Considering the consistency entering the deckers and filters to be 0.6 per cent, the water consumption in groundwood mills is about 48,000 U.S.G./ton (o.d.) groundwood. This amount of water carries the 2.5 million B.t.u. of heat to the thickeners. If the groundwood mill uses only fresh water (no recirculation), and the pulp is thickened to five per cent consistency, only 5,400 U.S.G. of water with about 280,000 B.t.u. of heat are carried to the paper mill and, therefore, about 90 per cent of the heat would be lost. The water consumption of the groundwood mill would then be 48,000 U.S.G./ton (o.d.). With the closed system, however, once equilibrium has been obtained, all the heat[2] generated at the grinders is carried to the paper mill and the water consumption drops to the amount carried with the thickened stock to the paper mill (i.e. 5,400 U.S.G./ton (o.d.) groundwood). The higher the consistency which is achieved at the thickeners, the less the water lost from the groundwood mill and, consequently, the lower the amount of fresh water make-up needed.

Consistency at the Thickeners	Fresh water required by groundwood mill in U.S.G./ton (o.d.)
3	9,100
4	6,800
5	5,400
6	4,500
7	3,800
8	3,400
9	3,000
10	2,700

The maximum fresh water requirement in a groundwood mill (48,000 U.S.G./ton (o.d.)) can be reduced, by closing the system and increasing the consistency at the thickeners, to a minimum of about 2,700 U.S.G./ton (o.d). It may be mentioned here that, in practice, the opinion is commonly held that it is better not to obtain high consistencies at the thickeners in order to "provide more warm water for the paper mill". This belief is incorrect for, with a closed system, regardless of the consistency at the thickeners, the total amount of heat generated in the groundwood mill must always be transferred to the paper mill. The consistency at

[1] In the following, the figure 2.5 million B.t.u./ton (o.d.) groundwood is used for average heat generation during grinding. In practice, the amount of heat generated is dependent on the sharpness of the stones and load, and varies considerably.

[2] The heat losses by radiation and overflows to the sewer have been neglected for this and the following discussions.

the thickeners is, however, very important with regard to the amount of heat recirculating in the white-water system of the groundwood mill.

The data given above consider only the amount of water needed for groundwood dilution from the grinding to the thickening stages. Besides this, considerable quantities of water are required for wood transportation and debarking as well as for bearing cooling water and general cleaning purposes. The total fresh water consumption of a groundwood mill, on the average, is in the order of 450-470 U.S.G./min. per 100 tons of daily production.

Heat Economy

To understand fully the importance of the white-water system in groundwood mills, it is necessary to discuss the heat balance of such a system and its effects on the grinding process. From practical operation, the terms "cold grinding", "hot grinding", "low consistency hot grinding" and "high consistency hot grinding" have been evolved without being clearly defined. According to our experience, the limits are:

"Cold Grinding"—pit temperature below 115°F.

"Hot Grinding" — pit temperature above 160°F.

"Low Consistency Grinding" — pit consistency below 1.5 per cent.

"High Consistency grinding" — pit consistency above 3.0 per cent.

However, these definitions do not mention the basic fact, the recirculated white-water temperature and it appears that this alone may be more informative than the pit temperature or consistency. That this is of major importance can be seen from the two Sankey diagrams of Figure 1. As closing the white-water system in groundwood mills is a matter of course in modern groundwood production, the following considerations can be restricted to closed systems. In such a closed system, a balance is always reached between the heat produced during grinding and the heat transferred to the paper mill. The amount of heat transferred to the paper mill is indicated by the consistency of the thickened groundwood and the temperature at the thickeners. With given equipment, the consistency at the thickeners is fairly constant so the heat transferred to the paper mill is chiefly indicated by the temperature at the thickeners. If this temperature is lower than required to achieve the balance mentioned above (e.g. at the start-up of the mill), less heat is transferred to the paper mill than

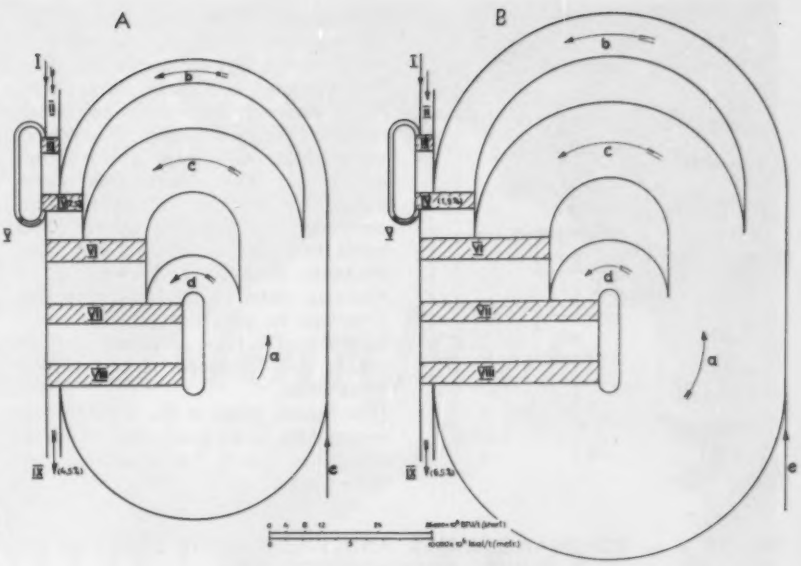


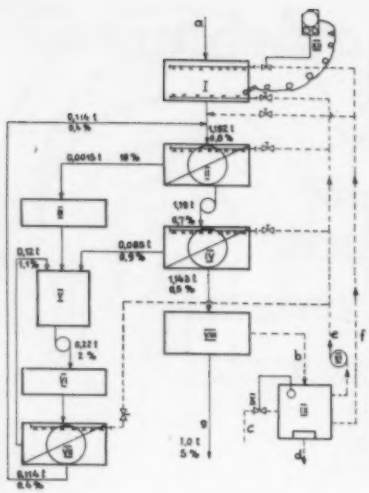
FIGURE 1—HEAT ECONOMY IN GROUNDWOOD MILLS: A—Low consistency (4.5%) of thickened stock. B—High consistency (6.5%) of thickened stock. I—Wood (A and B, 68°F.); II—Friction heat (A, 4,000,000 B.t.u./ton B. 3,600,000 B.t.u./ton); III—Grinding zone (A. 367°F., B. 367°F.); IV—Grinder pit (A. 175°F., B. 185°F.); V—Heat recirculation in the grinder (A. 1,060,000 B.t.u./ton, B. 1,130,000 B.t.u./ton) VI—Bull screens (A. 146°F., B. 169°F.); VII—Fine screens (A. 144°F., B. 166°F.); VIII—Thickener (A. 144°F., B. 166°F.); IX—Thickened stock to thick stock chest (A. 4,000,000 B.t.u./ton, B. 3,600,000 B.t.u./ton); a—Thickener white-water (A. 135°F., B. 160°F.); b—Grinder shower water (A. 6,360,000 B.t.u./ton, B. 11,500,000 B.t.u./ton); c—Bull screen shower water (A. 17,000,000 B.t.u./ton, B. 19,800,000 B.t.u./ton); d—Fine screen shower water (A. 9,500,000 B.t.u./ton, B. 12,700,000 B.t.u./ton); e—Make-up water (A. 68°F., B. 68°F.).

produced during grinding and the temperature at the thickeners increases until this balance is reached (and vice versa). If the consistency leaving the thickeners increases, less water is transferred to the paper mill and consequently the temperature of the white water system of the groundwood mill must increase until the heat balance is regained.

In Figure 1, the principle of heat economy in a groundwood mill is demonstrated by two Sankey diagrams. With example A, the consistency at the thickeners is only 4.5 per cent and, with this, the white-water temperature is 135°F. In order to obtain a grinder-pit temperature of 175°F., a grinder-pit consistency of 2.5 per cent is required. When thickening to 6.5 per cent consistency, as indicated in example B, the white-water temperature is increased to 160°F. and, with this, it is possible to achieve a grinder-pit temperature of 185°F. with a consistency of only 1.9 per cent (2). In practice, the grinder-pit consistency which would result with grinder-pit temperatures as mentioned here would be somewhat higher because of the heat losses which have not been considered for these calculations. It may be mentioned here that it is the practice in some mills to use thin stock to obtain the required consistency in the thickened stock chest. With this practice, although the capacity of the thickeners is "increased", the true consistency at the thickeners is decreased and equivalent to that resulting in the thickened stock chest. Therefore, the temperature of the white water must decrease considerably. Any dilution of the thickened stock should always be done with excess water from the paper mill.

With the increase of the consistency leaving the thickeners or filters, there is an accumulation of heat in the white-water system. Thus an additional amount of heat is recirculated to the grinders in the shower water and economic advantages result. If the amount of shower water used is constant, the white-water temperature indicates the amount of heat recirculated and it is on this fact that the importance

[1]The experiments made with pitless grinding show that grinder-pit consistency and grinder-pit temperature cannot have a great influence on the groundwood process but only are indirect indications of white-water temperature.



(Consistency of Thickened Stock, 5%; White-water, 0.07%). I—Grinder; II—Bull screen; III—Hammermill; IV—Fine screens; V—Coarse stock chest; VI — Refiners; VII — Refined stock screens; VIII—Thickener; IX—White-water chest; X—Water level controller for IX; XI — Recirculation water pump; XII—Grinder pit temperature controller; a—Wood to grinder (0.86 cords/ton); b — White-water from thickener (54,000 U.S.G./ton); c — Make-up water (4,700 USG/ton); d—Overflow to sewer; e—Shower water (35-45 p.s.i.); f — Dilution water (7 p.s.i.); g — Thickened stock to thick stock chest.
(The figures given in the drawing represent tons (o.d.) production of circulating stock and the prevailing consistencies).

FIGURE 2 — SCHEMATIC WATER AND STOCK FLOW DIAGRAM OF A "UNIT" GROUNDWOOD MILL

of this figure is based. As more heat is recirculated, less energy is required during the grinding process to generate heat. As shown by the data given in Figure 1, the indication (1) is that during wood grinding, the energy requirements decrease by 11 per cent with an increase in the white water temperature of 25°F. An increase of 10°F., therefore, should effect an energy saving in the range of 4.5 per cent. As these calculations do not take into account the heat losses, the savings in actual practice are lower and may be in the range of two to three per cent per 10°F. temperature rise. These theoretical conclusions have been proven in actual practice. It must be remembered, of course, that the beneficial effect of additional heat recirculation can show up as a lower specific energy consumption at the same groundwood quality or, by the same specific energy consumption at a higher quality.

The increase of white water temperature, therefore, has a considerable economic advantage and low consistency, high temperature grinding should be favored. It is once more emphasized that grinder-pit temperature alone has no direct influence on the technological or economic result of the grinding process. With high white-water temperature, grinder-pit temperature above 160°F. at low consistency can be reached easily. To operate with extremely high temperatures in the grinder pit (195-200°F.) at the expense of increased pit consistency may only be advisable, if at all, where the resin content of the groundwood is of major importance. Generally, it does not seem to be advisable to increase the pit temperature much above 160°F. but, preferably, to use an increase in the white-water temperature to reduce the consistency in the grinder pit.

Distribution of White Water

With regard to the closing of a system, the recommended arrangement is the collection of the water from all thickeners and filters into one tank to which the addition of make-up water is regulated by a level controller (see Figure 2). Usually fresh water is used for this purpose but it would be preferable to replace this by excess water from the paper mill provided not too much alum has been used in that system. If the pH of the paper mill water drops below about 5.2, foam difficulties may occur. These can be expected whenever the pH of the groundwood mill white-water drops below 6.0—a limit which varies with the local water conditions. The white-water tank in the groundwood mill should also be equipped with an overflow to account for changes in the white-water consumption (i.e. with shutdown of grinders). The provision for fiber recovery from this overflow is recommended.

As the white-water in the groundwood mill is used both for shower and dilution water, two separate piping systems should be provided with pressures in the order of 30-50 p.s.i. and 10 p.s.i. respectively. About 45 per cent of the water is used at the showers and 55 per cent for dilution and, of the total, about one quarter is required at the grinders and three quarters of the screens. System white-water should be used for cleaning the wires of the thickeners and filters. The use of fresh water for this purpose should be avoided as, in doing so, more water is added than normally required for make-up and this leads to a continuous overflow at the white-water tank. Generally, it is not necessary to use continuous showers on the deckers or filters as intermittent cleaning with a hose is usually sufficient. The overflow at the white-water tank should be arranged for easy inspection or, if this is not possible, overflow indicators or recorders should be provided.

Slime Control

With increased closure of the system of a groundwood mill, the importance of slime control increases. Generally, the groundwood coming from the grinders is sterile because of the high temperature in the grinding zone. However, this does not apply to the coarse screen rejects and these can, therefore, be a source of infection. The greatest source of infection is the make-up water. If fresh water is used for this purpose, it can be sterilized with chlorine. The beneficial effect of chlorination depends on the maintenance of a surplus of free chlorine in the water[1]. When chlorine, chlorine water or an hypochlorite is added to water, depending upon the pH range, varying amounts of hypochlorous acid (HOCl) are formed and this is the effective agent for slime control. At a pH below 6.5, HOCl is prevailing while as the pH increases progressively above this range, more and more hypochlorite ion (OCl^-) is formed. At pH 7.5, the ratio of HOCl to OCl^- is about 1:1 while above pH 9.5, only the OCl^- is present. The importance of the pH for sterilization with chlorine is emphasized by the fact that HOCl acts in 2½ to 3 minutes whereas with OCl^-, one hundred times as much time is required to achieve the same effect with the same amount of chlorine. To obtain the same effect in the same time with OCl^-, about 25 times as much chlorine must be used.

The water should be chlorinated as it enters the mill and ahead of any other water treatment. Generally, the addition of 0.4 to 0.6 p.p.m. of chlorine to the water should guarantee that a surplus of free chlorine is maintained. Other effects of the chlorination are the precipitation of iron and manganese, improved coagulation of precipitating solids and prevention of bad odors.

As more and more paper mill white-water is used in the closing of a system, the fresh water becomes less important as a carrier of disinfectants and,

[1] A very illuminating discussion of the chemistry relating to the chlorination of water in groundwood mills was given by Chamberlain and Martin (3).

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therefore, the addition of other slimicides plays an increasingly essential role (4) (5) (6). The aim is to control the infection nuclei circulating with the white-water and chlorophenates and/or mercury compounds are usually used. As the selection of the slimicide depends on the local conditions, the type of slime and, last but not least, the requirements of the final paper product, no general recommendations can be given. They should be added at central points in the white-water system (e.g. the white-water tank). Application in shock dosages generally shows better results than continuous addition. It may be advisable to change the slimicide periodically in order to maintain the toxic effect.

It must be emphasized that chemical slime control alone is seldom fully effective, at least from the economic standpoint. If slime is present in a mill, the primary objective must be to eliminate sources of infection within the system. Dead ends of piping, too large pipe dimensions and heavily corroded pipe lines are dangerous centers for slime growths from which infection can spread. Foam in flumes and channels and dead spots in headboxes and chests also are favorable points for slime growth. Where it is not possible to change the conditions, special efforts should be made to attain effective mechanical and chemical cleaning during shut-downs. With any changes in the layout of the groundwood mill, besides the other considerations, the problem of slime control should not be overlooked.

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More on Origin of Papermaking Terms

E. F. Barker
Field Editor, Paper Trade Journal

PAPER: Derives its name from the papyrus plant. Papyrus was not truly a fibrous, interwoven material. It was a laminated substance not made from macerated or disintegrated fiber as is true paper. Papyrus was known at the time of Alexander the Great and it is often said that it was used as early as 5,000 B. C. However, the use of papyrus for official purposes practically disappeared in the first half of the 10th century.

The word *paper* also stems from the Greek word Papyros meaning "card". The term paper came to Europe in two forms and it is believed that the places of entry of paper into Europe can be traced in these forms. The form which we know as paper came through Spain, brought there by the Arabs. The other form, "charta", came to Europe via Italy which is perhaps reasonable because of its Roman Byzantine connections. Italy has apparently never known the root "papir" except for the plant itself. (Piapiro is the name of the papyrus plant still grown in Sicily.) As soon as the substance paper was introduced either through import or manufacture into Italy it was called "chart" after the original writing material made from the papyrus plant. Consequently we have, originally for the same thing, two rival root words in European languages that have both given us a generous collection of derivatives. The greatest number of these was produced by the root "chart".

There is probably no word, not even paper, which has been so generally adopted and which has given rise to so many deriviations in a dozen or more languages as the Italian "carta". Our words "card" and "charter" in their numerous forms and combinations stem from this root. Even the word cartridge stems from this root.

REAM: We get the word "ream" from the Arabic word "rizma". This word came to denote "bundle" and its variants. Finally the word came to stand for a fairly constant quantity of paper in all European languages. (Spanish: "Resma." Portugese: "Rezma." Italian: "Risma." French: "Ráme." English: "Ream." German: "Riess." Danish "Riis.")

WATERMARK: Why the indentations which we call watermarks are actually called "watermarks" is not known because these marks in paper are no more made by the use of water than is the sheet itself? In German the design impressed in paper is called Wasserzeichen, which like the English term means watermark. In the French language the term is "filigrane" and in Dutch "patiernerken." These two terms are more suitable. An early author, Lewis, writing in 1737, always referred to watermarks as "papermarks" and all contemporary German writers called them "Papierzeichen" which also means papermark. The name watermark first appeared in the English patent granted to John Phitts, dated 1790. This was, no doubt, the first use of this term and as the word "Wasserzeichen" was not used by German writers until about 1810 we are led to believe that the term watermark, faulty in its meaning as it is, had its origin in the English language.

WOVE: The "wove" mold - covering originated in Europe and it was invented by John Baskerville about 1750. Baskerville of Birmingham, England was a printer. His wove mold-covering was made of fine brass screening and received its name because it was woven on a loom in about the same manner as cloth, as differentiated by the earlier wire stringing methods of manufacturing "laid" molds. The first book to be printed on woven paper made on a "wove" mold was Baskerville's Virgil in 1757. This new mold and its resulting paper caused a sensation in papermaking circles around that time because it had a much smoother and more even surface.

The early molds contained wire known as brass vellum. It is here where the common word *vellum*, used to describe certain finishes in modern papers, probably originated.

Bibliography

The material presented here was taken from many sources. Among them are the works of Dard Hunter, especially his "Papermaking Through 18 Centuries." Various issues of "The Paper Maker", published by the Paper Maker's Chemical Department of Hercules Powder Co.; and Weeks' "History of Paper Manufacturing in the United States."

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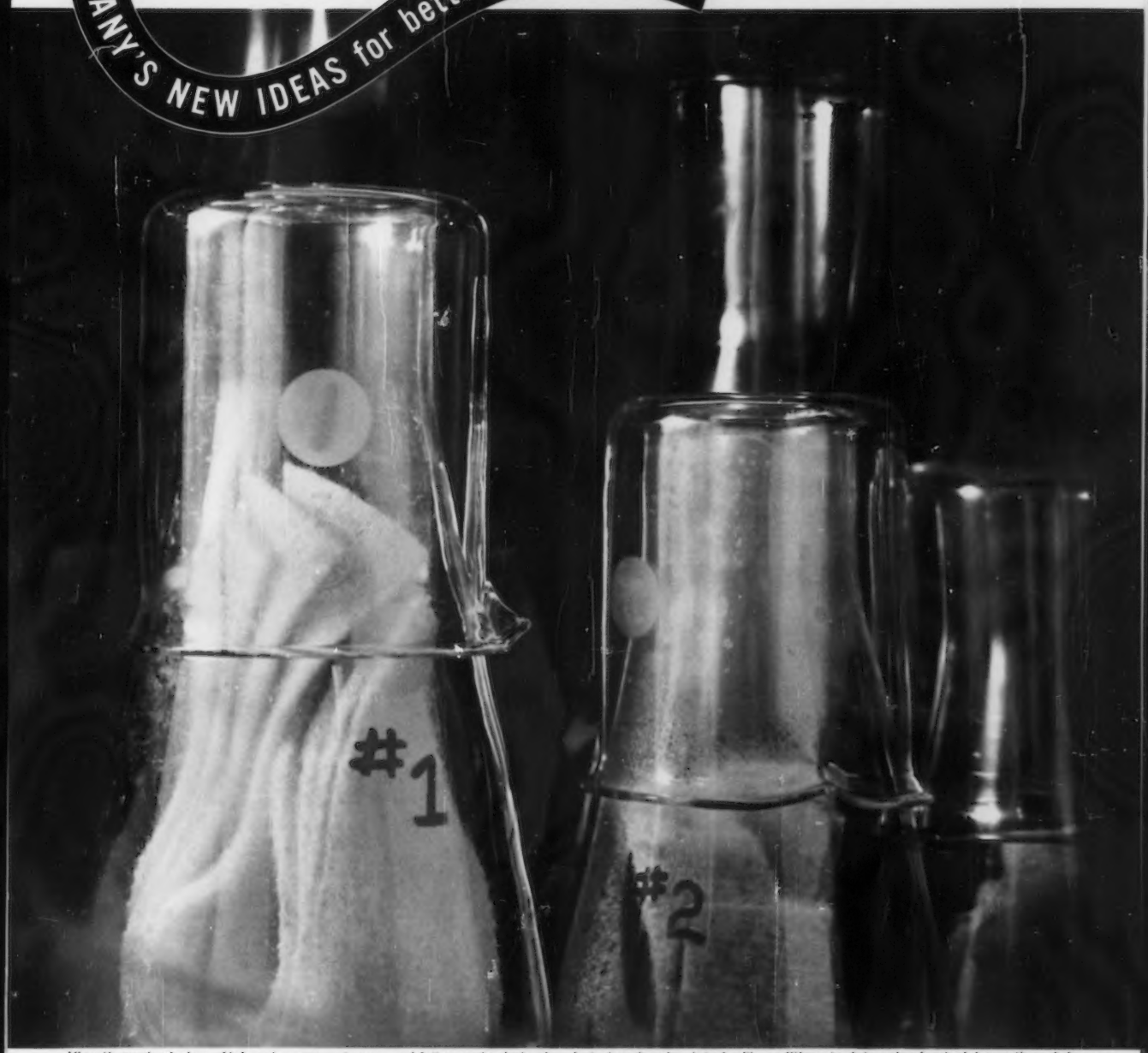

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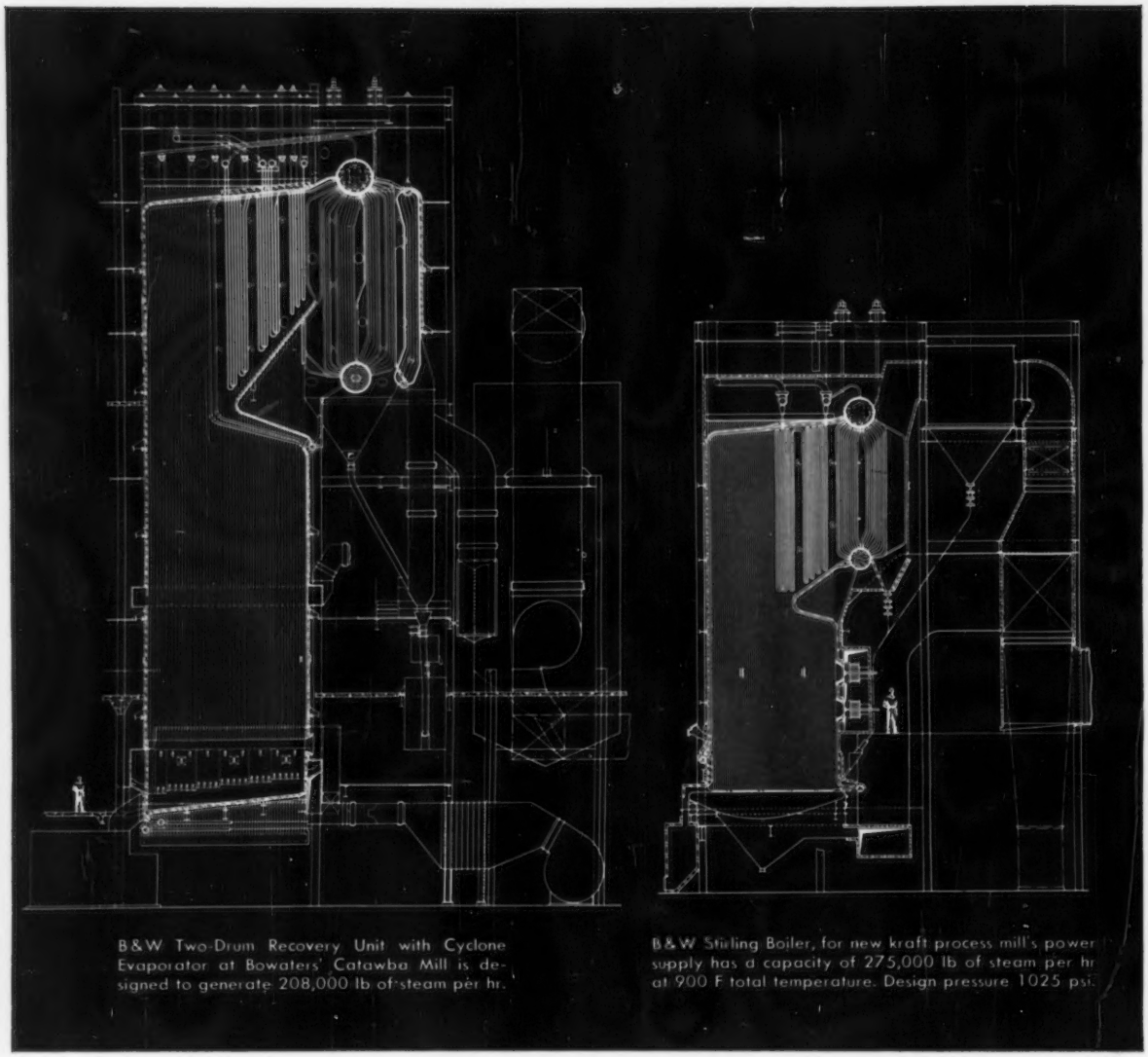

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‡ On Dock Atlantic Ports. * Freight allowed. † Varying Freight Allowances

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5	6.75/ 6.25
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	December 30	December 30	December 30	December 30
No. 1 Mixed Paper	$4.00/ 6.00	5.00/ 7.00	4.00/ —	12.00/ —
No. 1 News	13.00/ 15.00	14.00/ —	14.00/ —	12.00/ —
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Super Resorted Kraft Paper	30.00/ 35.00	35.00/ 42.50	35.00/ —	45.00/ —
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(Semi-chem. medium)	45.00/ 50.00	42.50/ 47.50	45.00/ 50.00	35.00/ 45.00
New 100% Kraft Corr. Cuts	50.00/ 55.00	50.00/ 55.00	55.00/ —	40.00/ —
New Br. Kraft, Env. Cuts	65.00/ 70.00	70.00/ 75.00	55.00/ —	45.00/ 50.00
New Br. Kr. Bag Waste Prntd.	55.00/ 60.00	55.00/ 60.00	50.00/ —	45.00/ 50.00
New Br. Kr. Bag Waste Unprintd	60.00/ 65.00	65.00/ 75.00	65.00/ —	45.00/ 50.00
No. 1 Groundwood Shvs.	25.00/ 30.00	24.00/ 30.00	16.00/ —	25.00/ 30.00
White Newsblanks	50.00/ 55.00	52.50/ 57.50	40.00/ —	55.00/ —
No. 1 Soft White Shvs.	55.00/ 60.00	60.00/ 65.00	60.00/ —	— / —
Super Soft White Shvs.	65.00/ 75.00	75.00/ 85.00	70.00/ —	— / —
Hd. White Shvs.	90.00/ 95.00	100.00/110.00	90.00/ —	85.00/ 90.00
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Col. Tab. Cards	50.00/ 60.00	55.00/ 62.00	47.50/ —	42.50/ —
Manila Tab. Cards	60.00/ 70.00	70.00/ 75.00	65.00/ —	75.00/ —
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White Ledger	45.00/ 50.00	50.00/ 55.00	52.50/ —	35.00/ —
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Casein, acid prec.:
dom. sh. pt. c.l. (30 mesh) cwt. 56.00 / —
Arg. ex. dock .....cwt. 20.75 /21.50
New Zealand .....cwt. 24.00 /25.00

Caustic soda:
c.l. wks. solid, 76% .....cwt. 4.30 / —
flak. & grd. drums, c.l....cwt. 4.70 / —
liquid 50% tanks.... 2.90 / 3.00
liquid 73% tanks.... 3.00 / —

China Clay
dom., dry-grd., airfloat:
325 mesh bgs., c.l. Geo. ton 10.00 / —
300 mesh, bgs., c.l. Geo. ton 13.50 /14.50
imp., white, lump, c.l. ex. dock 20.00 /35.00

Chlorine:
single-unit tanks, works.. cwt. 3.15 / —
multiple unit, 2-5 cars per yr. 5.25 / 4.05

Lime:
hydrated, bulk, c.l. N.Y. ..ton 23.63 / —
quicklime, bulk, c.l. N.Y. ton 22.13 / —

Gum rosin:
K, M, N, drums, c.l. Savan, cwt. 7.40 / 7.92

Rosin size:
70%, gum & pale paste, tank cars, south, sh. pt. .....cwt. 7.38 / 7.48

Saltcake:
dom. bulk, 100% anh. wks. ton 28.00 / —

Soda ash:
light, 58% ash bags, wks. cwt. 1.85 / —
bulk, c.l. wks. .....cwt. 1.60 / —

Sodium chlorate:
drums, c.l., wks. .....cwt. 9.00 / —
drums, l.c.l., wks. .....cwt. 9.50 /10.50

Sodium peroxide:
dms., c.l. E. of Miss. .....lb. .20½/ —
l.c.l. (same basis) ..... .21 / .21½

Sodium silicate, 40° Be.:
tank-cars, wks. .....cwt. 1.20 / —
drums, c.l. wks. .....cwt. 1.55 / —
47° Be. WW.
tank-cars, c.l. wks. .....cwt. 1.90 / —
drums, c.l. wks. .....cwt. 2.25 / —

Soybean, protein:
chem. isol., wks. c.l. bags...lb. .23 / —

Starches:
Corn, multiwalls, c.l. prod. plant:
pearl .....cwt. 6.49 / 6.75
white, dextrins .....cwt. 8.08 / 8.20
chlorinated .....cwt. 8.25 / 8.35
potato, Idaho, c.l. wks. ...cwt. 6.50 / —
East, fr. all. 50 cents cwt.
potato, Maine, f.o.b. wks. cwt. 6.25 / —

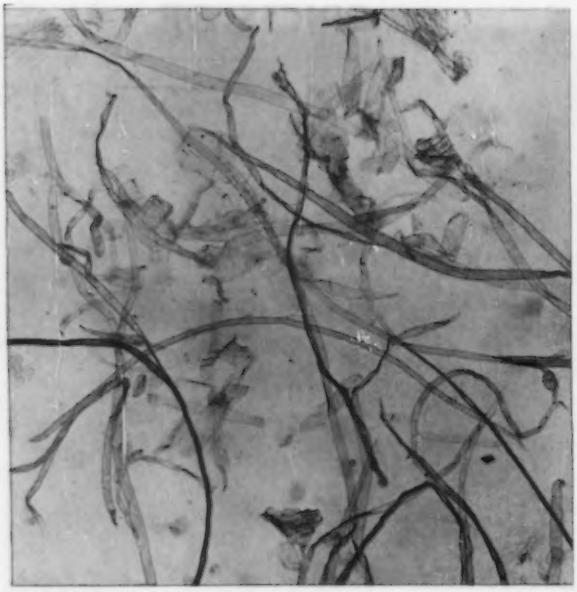
Sulphuric acid:
60° Be. cbys. c.l. wks. ....cwt. 2.00 / —
l.c.l. wks. .....cwt. 2.45 / —
tank-cars, wks. .....ton 18.60 / —

Sulphur:
crude, c.l. mines, contract, long ton 23.50 / —
f.o.b. vessels Gulf dock...ton 25.00 / —

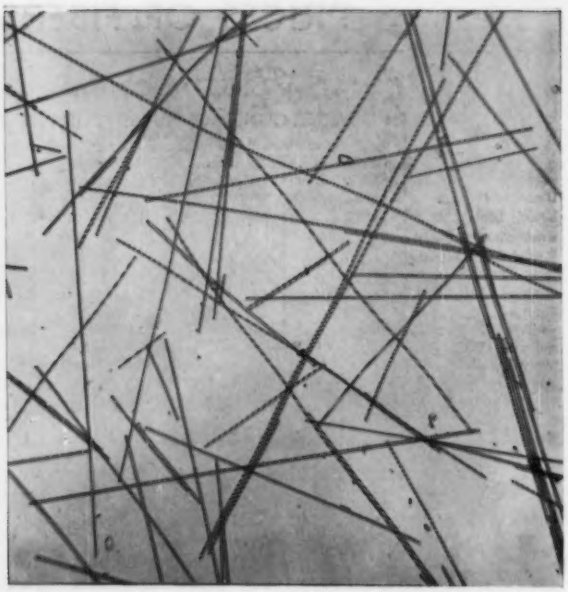
Sulphur dioxide:
liquid, coml. cyl., wks. ...lb. .10 / .12
multi-unit cars, wks. .....lb. .0535/ —

Talc, fibrous grd., bags:
c.l. wks., N.Y. .....ton 28.00 / —
l.c.l. wks., N.Y. .....ton 31.00 /36.00

Titanium dioxide:
anstase, c.l. dlvd. E. bags..lb. .25½/ —
l.c.l. dlvd. .....lb. .26½/ —
rutile, c.l. dlvd. .....lb. .27½/ —
l.c.l. dlvd. .....lb. .28½/ —



BAGASSE—Pulping costs are higher than for wood and supply is limited in this country.



GLASS—Fiber-to-fiber bondings and high fiber cost are the problems here.

Will Other Fibers Make Serious Inroads on Use of Wood for Pulp?

What is the future for bagasse, straw, bamboo, synthetic fibers, cotton and glass in papermaking?

By Malcolm N. May, Irving H. Isenberg, and A. Neil McLeod

Institute of Paper Chemistry
Appleton, Wisconsin

Our industry has long had a direct interest in pulpwood. This interest is growing as shown by continued acquisitions of acreage, but, as an industry and as individual companies, this asset requires a constant reappraisal of its usefulness. Our industry's interest is not primarily one of keeping pulpwood competitive, but rather one of keeping the investment productive by maintaining and expanding the market. This interest in years past has led to substantial changes in the source of cellulose fibers for papermaking. History has seen shifts from rag fibers to spruce fibers to southern pine and to hardwood. Now we are eyeing with increasing interest still other sources of cellulose fibers, and we hear more each day about the potential of synthetic fibers.

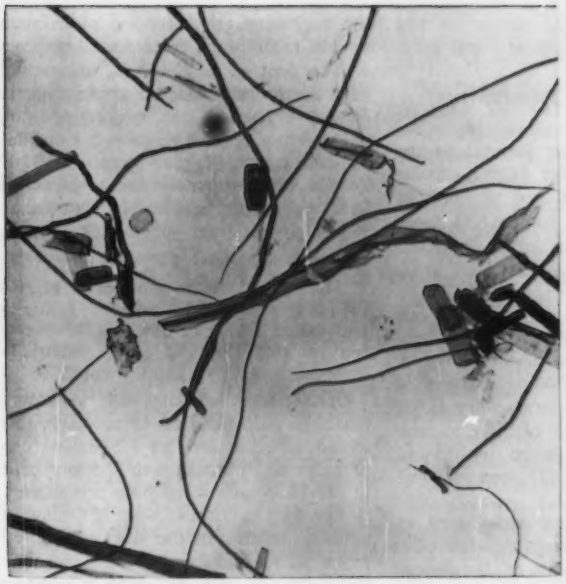
From a paper presented at an American Pulpwood Assn. committee meeting in Jacksonville, Fla., Nov. 20-21, 1957.

Mr. May is chief of Pulping and Papermaking Section, and Research Associate; Mr. Isenberg is Research Associate, Wood Technology Group; and Mr. McLeod is Economist at the Institute of Paper Chemistry.

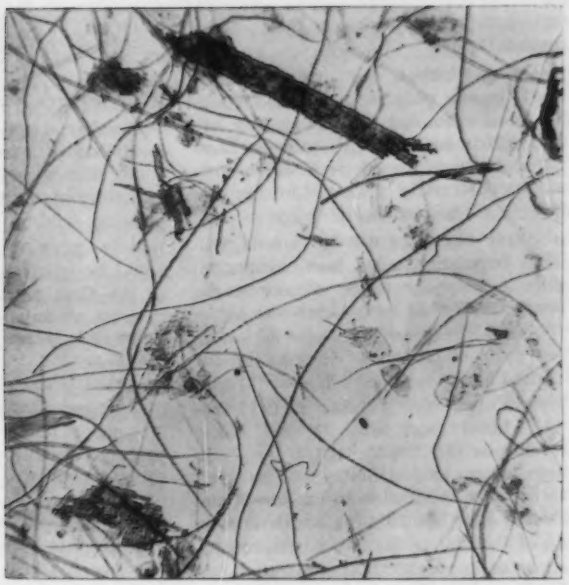
European Supply Declines

Since we are concerned with the competitive picture of our own wood pulps, we might consider first our position with regard to foreign imports. Ritchie *(1)* states that "the forest economy of Europe finds itself on the verge of a period of scarcity." Amplifying this sentiment, Larson *(2)* says "Of this much I feel certain—the relative importance of Europe as a factor in world demand for market chemical pulp will, in the next generation, be comparable to that of America in the last generation and, paradoxically, the relative importance of North America as a factor in world market pulp supply will be comparable to that of Europe in the last generation." If these observations are valid, future competition is unlikely from European market pulps.

Although the pulp and paper indus-



BAMBOO—Might be grown as a crop in the South but pulping costs appear to be high.



RICE STRAW—Straws make good pulps but collection, transportation and storage limit mill size.

try is growing rapidly in other sections of the world, it is growing largely to satisfy the increasing demands for paper in those areas which have had extremely low paper consumption in comparison with the United States. No new area looms in the foreseeable future as a serious threat to our wood pulp production, although the industry of other countries may expand on the basis of their domestic fiber to satisfy local requirements.

Wood Pulp—Cost Control

We are, however, faced with the problem of keeping wood pulps competitive at home. The fiber that will be used in the future will be the one giving the lowest cost-benefit ratio. Looking at both elements in this ratio we discern that the market will strongly influence the benefits. This is a whole specialized area that recommends itself to the efforts of the market researcher. The cost element in the cost-benefit ratio is under constant scrutiny from many aspects such as fire, disease and insect control, material handling, more complete wood utilization, and all of the other progressive steps that are constantly being made by foresters. Of long-range influence on this cost element will be the results of the genetics studies in progress in the south and other areas and the pattern of land utilization.

It is comparatively easy to work toward maximum effective utilization of company-owned lands. This is much more difficult in the case of lands owned outside of the company. The study of "America's Demand for Wood" by the Stanford Research Institute *(3)* estimated southern pulpwood production in 1960 would be 21.1 million cords. This is only about a half million cords above our present level. By 1975 the Stanford report estimated the south would produce 30 million cords. If the Stanford estimate is revised on the basis of the realized acceleration in production, it would appear that by 1975, the south alone will be producing as much pulpwood as the entire country is now producing. To achieve this requirement we will have to depend on short range improvements in technology. The wood to be harvested in 1975 is all growing now. To preserve this high production without net drain, and to look beyond the relatively short-term goal of 1975, we will have to devote every effort to maximum effective use of our available timber growing areas.

Cotton—Limited Use

Let us consider now the area of fibers competitive with wood. Natural cellulose fibers have some very distinct advantages for papermaking purposes. They are of a size and character to form relatively uniform sheets with good strength properties and good printing properties under today's high-speed papermaking operations. There are of course many sources for natural cellulose fibers with the fibers differing somewhat in their physical and chemical constitutions, depending on the source.

Here in the south, cotton is a well-known commodity of tremendous value in the textile field. It also is an excellent papermaking fiber and finds its way into high quality writing and legal papers, particularly through the production of pulps from textile cuttings. The limitations on its use are largely economic with its value even in the form of textile waste being far too great for the bulk of the pulp market. Staple cotton, at a price of some $0.34/lb., is obviously out of the price class of wood fiber, which sells in the bleached form for approximately $0.075/lb.

Bagasse—Limited Supply

Bagasse, the residue from sugar cane extraction, has received considerable attention as a source of papermaking fiber. Bagasse is composed of approximately 65 per cent fiber, 25 per cent nonfibrous pith cells, and approximately 10 per cent water-soluble material and dirt, although the precise physical-chemical composition varies widely. The average length of the fibers lies between 1.5 to 2.0 millimeters *(4)*. For comparison, the average fiber length of the tracheids of the hardwoods now being used for some purposes in the south usually falls between 0.7 to 1.6 millimeters. The nonfibrous pith cells of bagasse are in general undesirable in papermaking, and their removal presents an added technical problem to the utilization of bagasse. The strength properties of a bleached, depithed bagasse pulp are of the same order of magnitude as the strength of bleached hardwood kraft pulps, and for this reason its utilization would be more competitive with hardwood pulps than with

softwood pulps such as those from southern pine.

The production cost of a bleached kraft bagasse pulp in the United States has been estimated to be approximately $83/metric ton *(4)*. This may be compared with estimated production costs of approximately $70/metric ton for bleached kraft hardwood pulps *(4)*. All of these estimates are for slush pulp. Thus bagasse, from a cost standpoint, does not appear to be a very strong competitor, even with hardwood pulps.

An even greater economic limitation on the utilization of bagasse in the United States is supply. The world supply of sugar cane bagasse in 1951 was 24,793,000 short tons. Of this world total only 3,127,000 tons were available in the United States and its territories, with the territories of Hawaii and Puerto Rico contributing approximately all of the United States contribution except for some 500,000 short tons *(4)*. If these 500,000 tons within the continental limits of the United States were converted into a depithed, bleached kraft pulp with a 48 per cent yield, it would represent a production potential of only 240,000 tons, or approximately one per cent of the 1956 United States production of wood pulp of 22,000,000 tons *(5)*.

Very little of the cane sugar refined in this country comes from domestic cane because of high labor costs in harvesting; it comes rather from crude sugar imported from other areas. In fact, the production of cane sugar in this country continues to be an economic venture only through the sugar tariff which supports the price of sugar in this country well above the world market price. The current New York price on sugar, including freight to New York, is $5.65/cwt. The Cuban cost is $3.49/cwt. Thus there would seem to be little technical or economic pressure toward an extensive increase in the United States availability of bagasse.

The above figures on bagasse availability represent total availability and include bagasse now being consumed for fuel by the sugar refineries. The amount of surplus bagasse above that required for fuel varies with the size of the refining operation, with small refineries normally consuming all of their bagasse in this manner while a large refinery may have a surplus of some 25 per cent. If we assume that 25 per cent of the total world supply (24,793,000 short tons in 1951) is actually available, this represents a potential bleached pulp production of approximately three million tons, or only some 13.5 per cent of the 1956 United States wood pulp production. Thus, an optimistic estimate of the total world potential of bagasse pulp production does not constitute a large volume threat to the United States production of wood pulp.

Bamboo—A Slight Possibility

Another suggested source for cellulose fiber of particular interest to the south is bamboo. Some of the smaller varieties of bamboo are at present growing wild in the south, and more rapidly growing and larger varieties could be cultivated in the costal areas of the Gulf and South Atlantic states. A great advantage of bamboo over our pulpwoods is that a culm of about three years growth is suitable for pulping. In India where bamboo is extensively pulped and used in almost every grade of paper, a felling cycle of three to four years is usually employed with yield roughly estimated at 0.75 tons of bamboo/acre/year.

The fibers in bamboo are almost as long as those in our common softwoods. The average fiber length of *Dendrocalamus strictus* is about 3.0 mm. while *Ochlandra travancorica* has an average fiber length of some 4.0 mm. The strength properties of the bamboo pulps depend on the pulping process employed but in general rank between those of our hardwood and softwood kraft pulps.

The production cost of a bleached kraft bamboo pulp has been estimated to be approximately $124/metric ton, using a reported price for bamboo in India, but with conventional U.S. processing cost data *(4)*. This may be compared with a production cost estimate for a bleached kraft softwood pulp of $112/metric ton, both being on a slushed pulp basis. Although the bamboo pulp does not appear to be strongly competitive from a cost standpoint, it is rather interesting to speculate on the fiber producing potential of marginal marsh lands, now essentially worthless, which could be cultivated to the production of bamboo.

Straw—Economics?

An agricultural residue available in many parts of the south in some quantity is rice straw. Rice straw fibers, like other straw fibers, are comparatively short and slender with an average fiber length of approximately 1.0 to 1.5 millimeter, comparing in this respect with the fibers of hardwoods. As a result of fiber size and high hemicellulose content, straw pulps are more often used in high density papers with low tear resistance and low opacity. Straw pulps are roughly comparable to hardwood pulps in tearing strength, but as a result of good fiber/fiber bonding, generally give somewhat better bursting and tensile strength than hardwood pulps. Straw pulps could be blended with softwood pulps for many purposes, but would not be directly competitive with present high strength softwood pulps such as the kraft pulps from southern pine.

The cost of a bleached straw pulp has been estimated at approximately $96 to 117/metric ton, depending upon the pulping process employed *(4)*. This is substantially higher than the $70/metric ton estimated for a bleached kraft pulp from hardwoods, with which the bleached straw pulp would have to compete for most purposes.

The United States production of rice in 1955 was 2,671,000 tons. Using a conversion factor of 1.4 tons of straw/ton of rice *(5)*, the total potentially available rice straw supply would be 3,740,000 tons. Using an estimated bleached pulp yield of 45 per cent, this would be equivalent to 1,680,000 tons of pulp, or approximately 7.5 per cent of the 1956 total wood pulp production. It would be very misleading of course to consider that all of the straw computed from rice production would actually be available. Present grain harvesting methods are not conducive to straw collection, and thus some modification of present practice would be necessary in order to obtain the straw. Mechanical bailers have been developed, however, to solve this problem of straw collection. Transportation presents still another difficulty. In those countries where straw is actively employed for pulping, the ideal radius for transportation is normally considered to be about 30 to 35 miles. The cost of hauling over longer distances tends to limit straw pulping to relatively low production operations, thus making it difficult to minimize operating expenses through high productivity. Thus, largely for economic reasons, straw would not seem to pose a serious competitive threat to the pulpwood field.

Many other products have been suggested from time to time as possible pulping raw materials. Among them have been Crotalaria, ramie, cornstalks, Lespedeza, castor stems, okra stalks, sawgrass, and even Spanish moss and water hyacinths. These last two contain relatively little fiber, being composed largely of nonfibrous cells. The other materials contain varying amounts of fiber which would be technically feasible for certain papermaking purposes. However, the problems of large-scale collection and storage largely argue against their utilization.

Synthetic Fibers—Bonding

Turning now to an entirely different competitive area, synthetic fibers have recently attracted considerable attention for papermaking purposes. Emery and Lantos *(6)*, in a discussion of the future prospects of synthetic fiber utilization, have suggested their use for papers which might replace fabrics for some

purposes and for other specialty papers involving improved strength performance.

There have been numerous technical problems in the development of papers from synthetic fibers. The major difficulties hinge around the fact that most of the present synthetic fibers do not develop strong fiber/fiber bonds when formed and dried from water in the normal papermaking operation. Natural cellulose fibers, on the other hand, when properly treated, develop quite high degrees of fiber/fiber bonding. The cell wall in natural cellulose fibers is composed of fibrils which become partially dislodged from the fiber surface on beating in the presence of water to greatly increase the fiber surface. Most synthetic fibers and regenerated cellulose fibers such as acetate or viscose rayons do not have this fibrillar structure and thus there is very little tendency toward fiber/fiber bonding when such fibers are employed in a normal papermaking operation. Beating does not develop fiber/fiber bonding in such cases. Thus, although the synthetic fibers may have very high intrisic fiber strength, this strength cannot be utilized unless special techniques are employed to develop the bonding between the fibers. Emery, Howell and Sands *(7)* have described some of the techniques which are available for achieving fiber/fiber bonding with these synthetic fibers. These are: (a) solvent bonding, (b) synthetic polymer bonding, and (c) thermoplastic fiber bonding.

Solvent bonding depends on the fact that water solutions of some salts at high concentrations are solvents for the organic polymer fibers, but become nonsolvents at dilute concentrations. Thus, if a web of synthetic fibers is impregnated with such a salt solution, evaporation tends to localize the salt concentration at the cross-over points of the fibers. During evaporation, the solution becomes sufficiently concentrated at these points to partially dissolve a small portion of the fiber surface. On complete evaporation the polymer reprecipitates and bonds the fibers. Until the sheet can be impregnated and dried to obtain bonding through this salt technique, the web is very weak and requires much more careful handling than is necessary in connection with normal papermaking operations.

In synthetic polymer bonding, the sheet is impregnated with a dispersion or solution of the bonding polymer. On drying, the polymer concentrates by capillary action at the cross-over points of the sheet structure. Application of heat and pressure is necessary in order to complete the bonding. As in the previous case, the untreated web must be rather gently conveyed and handled to avoid breakage.

In thermoplastic fiber bonding a small percentage of low melting point synthetic fibers are incorporated with the primary fibers. As the sheet is carried through the drier section of the paper machine, the low melting point fibers tend to fuse at the fiber junction, thereby producing fiber/fiber bonding.

By these techniques, sufficient fiber/fiber bonding can be obtained to utilize the high intrinsic strength of the synthetic fibers, and sheets can be produced which far surpass conventional cellulose papers in tensile strength, tearing strength, folding endurance, etc. The difficulty in achieving fiber/fiber bonding has stimulated considerable research activity toward the development of a synthetic fiber more like the natural cellulose fiber in its fibrillar structure. A successful development in this direction has been recently announced by one of the synthetic fiber companies *(8)*, and it will be most interesting to see what new contributions this brings in synthetic fiber utilization for papermaking.

From the number of synthetic fibers available one can select the type which best fits the end use requirements. For example, the polyamide fibers tend to have high strength, toughness, abrasive resistance, and good flex endurance. The acrylic fibers are resistant to outdoor exposure, mold, acid and other chemical attack. The polyester fibers tend to be heat resistant, have high strength and good flex endurance. All of these fibers have low moisture pickup and, for the most part, good dimensional stability.

The regenerated cellulose fibers have most of the drawbacks of natural cellulose fibers with regard to chemical and heat resistance, and in addition, lack the fibrillated structure of natural cellulose fibers so important to the development of fiber/fiber bonding through the rather simple expedient of beating.

All of the synthetic fibers are rather expensive, ranging from approximately $.30 to .35/lb. for the regenerated cellulose fibers to over $1.00/lb. for some of the synthetic fibers. Thus, for the foreseeable future, synthetic fibers would seem to be limited by price to a relatively low volume specialty market where their unique properties would justify the cost.

Glass Fibers—Price

Since the efforts of O'Leary and coworkers of the National Bureau of Standards in making paper from glass fibers *(9)*, there has been considerable interest in this area of specialty papermaking. Glass fibers are of course quite resistant to heat, chemical, and bacteriological action. They can be manufactured in controlled diameters down to approximately 0.2 micron in size. As with the synthetics, fiber/fiber bonding presents a major difficulty in the use of such materials for paper. Work by the National Bureau of Standards has indicated that the use of acidic conditions is beneficial in development of natural bonding between the glass fibers, but this still results in a very low level of bonding compared to that in conventional cellulose papers. Various synthetic polymer binders may be employed to achieve fiber/fiber bonding, but such agents are usually more sensitive to heat and chemical than the glass fibers themselves, thus sacrificing some of the unique potential of glass fiber paper.

As in the case of the synthetic fibers, glass fibers are rather expensive, ranging from approximately $.50/lb. for 3.5 micron fibers to over $3.00/lb. for the extremely fine diameter fibers. Thus again, price would seem to limit the application of such materials to a relatively small specialty market. It is rather interesting to speculate in passing, however, on possible future price trends for glass fiber. Glass is manufactured from relatively low cost materials, and a large part of the total cost is a manufacturing cost which could conceivably be substantially reduced by volume production and technological advances.

Wastepaper Always Important

One source of papermaking fiber which should be included in any discussion of fiber sources competitive with wood is that of wastepaper. Approximately 30 per cent of the total production of paper and board in the United States utilizes wastepaper. In 1955, approximately 1.4 million tons of fiber were collected from New York City, within an area of approximately 315 square miles. This is equivalent to the fiber output of 7,000 square miles of forest land producing ½ cord/year/acre and yielding 0.625 tons of pulp/cord. The factors limiting even further use of wastepaper are largely economic involving difficulties in collection and sorting. These problems are minimized in metropolitan areas. Thus, extensive wastepaper utilization is largely confined to such areas. In spite of these problems, however, the present relatively high use of wastepaper would seem to indicate that this source of fiber is a healthy companion to wood in the paper and board field. As virgin fiber pulps are upgraded, the wastepaper resulting from them is also upgraded. Such improvements in the potential strength of wastepaper coupled with technological improvements in wastepaper processing should keep

Figures of the Week

PAPER PRODUCTION RATIO REPORT—American Paper & Pulp Assn. Figures

(Production as percent of normal capacity)

COMPARATIVE WEEKLY SUMMARIES

1957	Nov. 23 91.9	Nov. 30 86.0	Dec. 7 90.6	Dec. 14 91.2r	Dec. 21 93.5
1956	Nov. 24 92.5	Dec. 1 98.6	Dec. 8 99.3	Dec. 15 98.4	Dec. 22 99.3

r Revised.

COMPARATIVE MONTHLY SUMMARIES

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year Avg.
1957	94.2	97.0	97.1	94.0	94.6	93.3	75.6	90.5‡	85.8‡	92.4‡	89.8‡		
1956	99.6	102.6	102.9	102.5	101.8	99.9	85.6	96.7	94.3	99.5	97.6	90.9	97.9

‡ Preliminary.

COMPARATIVE YEARLY SUMMARIES

	1950	1951	1952	1953	1954	1955	1956	1957
Year to Date	96.2	99.2	90.2	93.2	92.1	95.6	98.5	91.1
Year Average	95.8	98.0	88.6	92.3	91.6	94.9	97.9	

All of the above data is based on tonnage reported to American Paper and Pulp Association. Does not include mills reporting to National Paperboard Association, except in isolated cases where both paper and paperboard are produced and separate tonnage figures are not readily available. Does not include mills producing newsprint exclusively.

PAPERBOARD OPERATING RATIOS†

COMPARATIVE WEEKLY SUMMARIES

1957	Nov. 23 94	Nov. 30 86	Dec. 7 84	Dec. 14 92	Dec. 21 93
1956	Nov. 24 89	Dec. 1 86	Dec. 8 95	Dec. 15 95	Dec. 22 96

COMPARATIVE MONTHLY SUMMARIES

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year Avg.
1957	91	94	94	92	93	91	72	94	91	97	92		
1956	100	100	99	100	99	98	77	95	89	96	93	84	94

† *Percents of operation based on "Inch-Hours" reported on a 6-day basis to the National Paperboard Association.*

SUMMARY OF PAPERBOARD STATISTICS—National Paperboard Assn. Figures

ITEM	THIS WEEK ENDING Dec. 21, 1957	LAST WEEK ENDING Dec. 14, 1957	CUMULATIVE TO DATE Jan. 1 to Dec. 21, 1957
% Activity	93%	92%	92%
	Tons	*Tons*	*Tons*
Total Production	290,705	288,876	13,961,230
Liner	98,062	97,309	4,820,607
Corrugating Material	43,585	45,387	2,140,916
Chip & Filler Board	4,869	4,369	277,120
Total Containerboard	146,516	147,065	7,238,643
Folding	53,414	50,884	2,546,192
Set-Up	9,782	10,152	563,274
Special Food Board	24,660	24,150	1,204,148
Other	56,333	56,625	2,408,973
Total Boxboard	144,189	141,811	6,722,587
Total Orders	*Tons*	*Tons*	
Received	206,345	254,413	
Unfilled End of Week	276,494	368,256	

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wastepaper utilization a strong factor in the industry.

Summing Up

Our industry is certainly fortunate in having a self-replacing raw material, and the dominant position of wood in this raw material supply certainly attests to its strong competitive position. In spite of some of the recent press notices, there do not seem to be any fibers which crowd wood pulp seriously in the foreseeable future for papermaking purposes. It seems more likely that competitive fibers may be drawn into the pulp and paper picture as more profitable outlets may develop for wood. For example, if southern pine should ultimately be in greater demand for lumber than for pulp, the economic balance might be shifted sufficiently to make some of the competitive fibers more attractive. In other words, it will probably be the availability of wood for papermaking purposes which will influence the utilization of other fibers rather than the availability of other fibers which will influence the utilization of the wood.

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No. 1 in a series

Right off the Wire

An all-electronic telephone exchange (said to be the first for commercial use) has no moving parts, is noiseless and can be used in explosive atmospheres. It includes a "memory" which will hold an incoming call.

Wire can be strung beside a railroad track by a new travelling crane at the rate of 60,000 feet per hour.

Simplex recently completed one of the largest and heaviest shipments of cable ever transported on one reel — nearly two miles of ANHYDREX XX insulated submarine cable weighing 60 tons.

A new rubber-like material is porous, but will contain liquids.

Boron, lithium, hydrogen peroxide and fluorine compounds are to be the fuels of a new bomber reported to be in the design stage.

Smog-causing chemicals from automobile exhausts can be eliminated by a chemical catalyst developed by an automobile manufacturer.

Improvements in the explosive rivet have made it noiseless.

Only the touch of a hand is needed to light a new lamp. The electricity in the hand does the work.

Thorium is about three times as plentiful as uranium. A new process for the production of reactor-grade thorium should lead to a reduction in the cost of atomic fuel.

A high-output ultraviolet lamp, for heating and air-conditioning ducts, is claimed to be 1,000 times more effective in killing viruses and bacteria than an equal amount of radiation from the sun.

The world's largest solar furnace is to be completed in 1959. It will produce temperatures as high as 8,000°F, which is about 70% of the temperature of the sun's surface.

An ultra-hard glass has been developed that retains its hardness up to 1508°F.

The cost of converting sea water to fresh water has been reduced from $1.50 to 60 cents per thousand gallons.

"Talk-back TV", a new advance in educational television, enables a pupil to ask questions of a teacher who is broadcasting from a distant room.

Scientists have been able to produce shock waves with speeds of more than 100,000 mph (above Mach 150) involving temperatures higher than 100,000°F.

Some 1958 automobiles are using aluminum instead of copper in battery cables.

The first deep sea telephone cables to utilize the revolutionary new Bell Laboratory vacuum tube repeaters were manufactured by Simplex. Minimum tube life is expected to be 20 years.

Danish trawlers are using nylon propellers. The four-foot, three-bladed size weighs only seventeen pounds and they reduce vibration, resist impact damage and corrosion.

A cell that generates electricity by the chemical action of oxygen and hydrogen has been announced. It avoids some of the disadvantages of both dry cells and storage batteries.

An airplane has been built which can change its shape while in flight for the purpose of testing aerodynamic configurations.

C-L-X (Sealex) is the name of a new, completely sealed, corrugated metallic cable sheath manufactured by Simplex. It is pliable, moistureproof, and permits cable engineers to select the most economical cable cores, while assuring the greatest mechanical protection available.

Observations of the aurora during the Geophysical Year show that it occurs simultaneously at both the North and South Poles. This definitely identifies it with the earth's magnetic field.

A miniature battery about the size of a paper clip is said to deliver a steady flow of current for 176,000 hours.

Shirtsleeve Service

Simplex recently completed an order for 4600 ft. of Anhydrex XX Parkway Cable. The Simplex man was on the spot to help with installation, which happened to be on a 9,500 ft. mountain in rough terrain. He helped design a reel mounting bracket (for holding up to 7200 lbs.) for the front of the tractor used for laying. He supervised the laying of two lengths 2200 feet long.

This case typifies the kind of cooperation that Simplex offers in order to assure correct installation and satisfactory service.

SIMPLEX WIRE & CABLE CO.
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Trends in Use of Non-skid Treatments for Shipping Containers

T. J. Gross

Technical Adviser Union Bag-Camp Corp. and
Chairman, Technical Committee Fibre Box Assn.

Chemical coating seems to be the best method of anti-skid treatment for corrugated shipping containers and the best place for application is on the box flaps after filling. These were the conclusions drawn by Mr. Gross, in the report of the Technical Committee to the annual meeting of the Fibre Box Ass'n. Below are the highlights of this report as it deals with anti-skid treatment.

Recently a new ingredient has been added to corrugated boxes. I am referring to non-skid materials. A year or two ago a few large box users thought they needed some kind of preparation or surface treatment to keep their boxes from slipping and sliding during warehouse handling and shipping. The idea caught on very quickly and in a reasonably short time box makers all over were being asked by their customers about their ability to furnish non-skid treatments. At the same time a number of chemical and adhesive manufacturers jumped on the band wagon and started promoting the virtures of a variety of strange new concoctions. Meanwhile, back at the ranch, the poor box maker was slowly losing his mind trying to figure what kind of stuff to use, and how to put the goo on the boxes. In order to provide some kind of guidance to the bewildered box maker, the Technical Committee has undertaken a study of non-skid methods and materials, the purpose of which is to evaluate the various preparations in current use and settle on the best method of application. This study is by no means completed and the committee is not yet ready to make final recommendations.

First of all let me say that the need for non-skid is not all imaginary. A number of box users having a certain set of conditions in their plants do have a problem with slipping and sliding of boxes. This problem has grown out of three factors. First of all there is the trend toward smoother and slicker board finishes. This, of course, comes about in response to customers' demands for better and better printing surfaces. Secondly, the growing tendency toward over-all, or large area printing with high-gloss inks has contributed to the slipperyness of boxes. And, finally, the development of modern handling methods involving palletized loading and handling, higher speeds of movement by fork trucks and higher stacking in warehouses has compounded the problem.

Various Non-Skid Techniques

The problem, stated very simply, is this: How can we make a box with a slick finish on the side and end panels to give good printing and a rough finish on the top and bottom to give good traction? This is the job that non-skid is supposed to do. In its study the Technical Committee found many variations of non-skid techniques in use today. However, they can be divided roughly into four types. These are:

1—Mechanical roughening of the surface of the top and bottom flaps.

2—Applying a coating of non-skid material to certain areas of the box blank.

3—Adding a non-skid ingredient to the printing ink or printing with a special non-skid varnish.

4—Applying a non-skid preparation to the packed and sealed box in the customer's plant.

Mechanical Roughening

First, let us consider the mechanical roughening method. This is generally done on the corrugator just before the double backer by means of a deeply knurled segmented roller backed against a rubber roller and contacting the outer facing from the under side in a three-inch wide band aligned so as to correspond with the top and bottom flaps of the blank. The pressure of the knurled roller can be adjusted to produce indentations in the liner—resulting in raised points on the outer surface—or complete puncture of the liner.

Now this seems like a cheap, simple and effective way to produce non-skid boxes. It doesn't use any material, doesn't require an extra operation and takes a minimum of equipment. However, here are a few points that bear consideration.

1—The indentations cause unsatisfactory contact between outer facing and corrugated sheet in the affected areas thereby requiring a heavier than normal application of adhesive. Also the raised points of the outer surface tend to keep the board away from effective contact with the hot plates thus delaying curing time and necessitating slower running. Reports which we have indicate that this method will slow corrugator speeds between 10 to 15 per cent.

2—The mutilation of the board in the flaps has a serious effect on the strength of the box and can cause a reduction of 10 to 15 per cent in end-to-end and side-to-side rigidity.

3—The over-all caliper of the board is significantly increased resulting in larger bundles for the same count and resulting need for more storage area.

4—It is difficult, if not impossible, to use suction-cup type automatic case openers on the boxes.

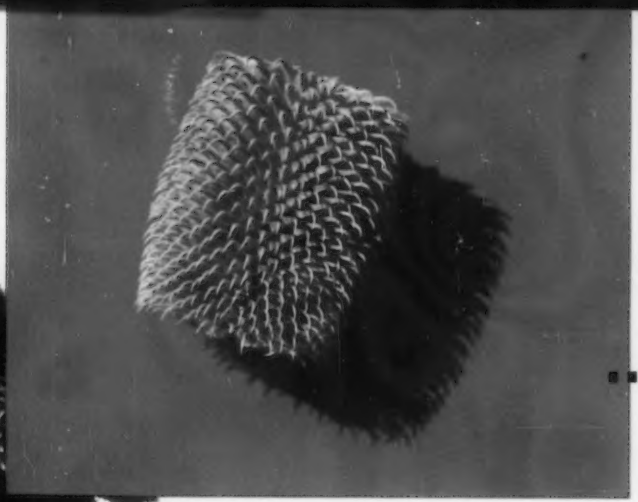
5—The mutilation of the surface makes printing on the flaps most difficult, to say the least, and generally gives the box an unfavorable appearance.

6—Tests indicate that the boxes made by this method have poorer non-skid qualities than those employing other techniques.

Coating Box Blanks

The second technique is the application of a coating of one of the many non-skid compounds now available on the market. These are generally latex or resin water emulsions or colloidal solutions of silica which impart a high coefficient of friction to surfaces to which they are applied. The two principal methods of application are:

1—By means of roller coater on the corrugator just before the slitter station.



...dipsacus fullonum

is the botanical name for a prickly pompom better known as the teasel. An essential "tool" in feltmaking, it provides, better than any man-made product, the all-important nap so vital to certain types of felts.

In the production of fine paper grades, such as bond, writing, book and printing papers, nap furnishes the level, "cushioned" surface that imparts a smooth finish to the paper. The proper amount and type of nap assures that the sheet will follow the right felt without crushing, drop-offs or blowing. Other types of felts are napped to meet particular conditions.

Huyck's advanced techniques and rigid quality control assure uniform nap felt after felt. To determine the correct degree of nap for your requirements, consult your Huyck Sales or Field Service Engineer.

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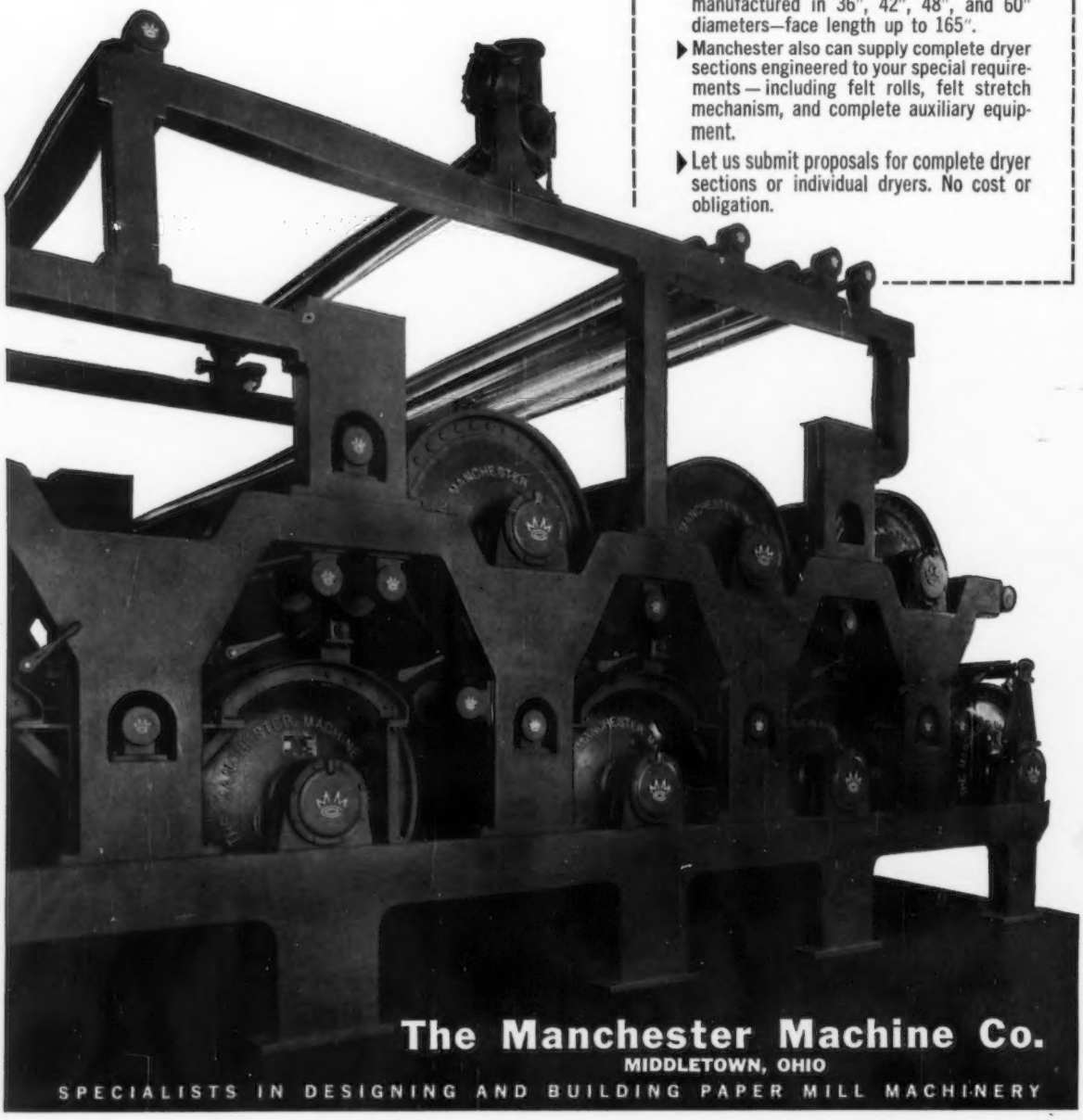
- Supplied with journals for plain bearings or for anti-friction bearings.
- Dryer faces precision ground and polished.
- Dryers are of bolted head construction, manufactured in 36″, 42″, 48″, and 60″ diameters—face length up to 165″.
- Manchester also can supply complete dryer sections engineered to your special requirements — including felt rolls, felt stretch mechanism, and complete auxiliary equipment.
- Let us submit proposals for complete dryer sections or individual dryers. No cost or obligation.



The Manchester Machine Co.

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2—By means of a spray just after printing.

Both of these methods of application have their advantages and disadvantages. Roller-coating at the corrugator is generally more efficient and more economical. The compound is applied with segmented rolls in three-inch wide bands and very little is wasted. It is easier to control and there is less mess and no particular health hazard. Also equipment requirements are not elaborate. Since application is made to hot board, drying is very rapid and no reduction in corrugator speed is needed. On the other hand, the effectiveness of non-skid compounds applied in this way is not as good as a spray application. A roller coater gives a continuous film which is not as good from a non-skid standpoint as the discontinous coating of tiny droplets produced by a spray. Since the film is applied before printing, it will not counteract slipperyness caused by high gloss inks. Also, since application must be made to both inner and outer flaps it may create a case sealing problem.

Spray application after printing appears to give the best non-skid performance both because of the discontinous nature of the coating and because it covers the printing as well. Incidentally I should point out that neither method appears to impair printing quality. In fact, many people find that printing appearance is enhanced by some non-skid preparations. By proper arrangement of the jets, the compound can be kept off the inner flaps to a large extent thus reducing case sealing complications. On the debit side, spray application is somewhat more wasteful of material. It is more difficult to control and unless well hooded can create a health hazard. It takes longer to dry since it is applied to cold board and generally requires more elaborate equipment involving more care and maintenance.

Non-Skid Ink

Probably the easiest and simplest method of applying non-skid in the box shop is by the use of non-skid ink. If the outer flaps of the box are to be printed, the compound is simply added to the ink. Of course, in such cases there must be sufficient print copy to insure an effective amount of non-skid compound getting on the flaps. If there is no printing on the flaps, a special varnish, which is colorless, may be put in one of the fountains in place of ink and printed on the flaps in block form. Depending upon the accompanying printing, this may require a three-color press or two passes through the press. This method requires no special set-up and no additional equipment. Also it is clean and easy to control and does not require slowing down any production equipment. Adding the compound to the ink, however, may detract from printing quality. This Committee has not yet had sufficient experience with this technique to properly evaluate its effectiveness as compared with other methods.

Applications to Boxes

The fourth and final technique of applying non-skid to boxes is in the customer's plant. This is generally done by a spray application to the top of the boxes after they emerge from the automatic case sealer. It is the unanimous opinion of the Technical Committee that this is by far the best and most efficient method of application. This conclusion was arrived at not simply as an obvious means of transferring the burden from the box maker to the customer, but as a result of an honest evaluation of all the factors involved. Consider for a moment these points:

1—Customers application is far and away the most economical because it puts the non-skid compound on the boxes only where needed, when needed and as needed.

2—By treating the top flaps only, there is an immediate saving of 50 per cent in material.

3—The coating is fresh when the boxes need it; there is no loss of effectiveness due to deterioration during storage of flat boxes.

4—Since the compound is applied at the end of the line, the boxes move easily through the conveyor systems and case sealer without the drag exhibited by box-factory applied non-skid boxes.

5—There is no loss of non-skid from rub-off on the conveyor system in the customer's plant.

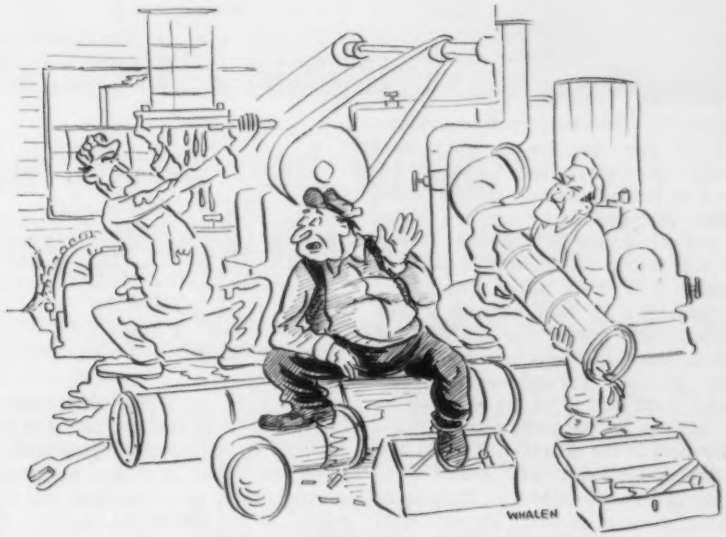
6—Only those boxes which need non-skid are treated. Customer has complete flexibility as to use or non-use of the treatment within any one run of boxes depending upon his particular conditions.

7—There is absolutely no case sealing problem.

8—There is coverage not only of the board but also of the ink.

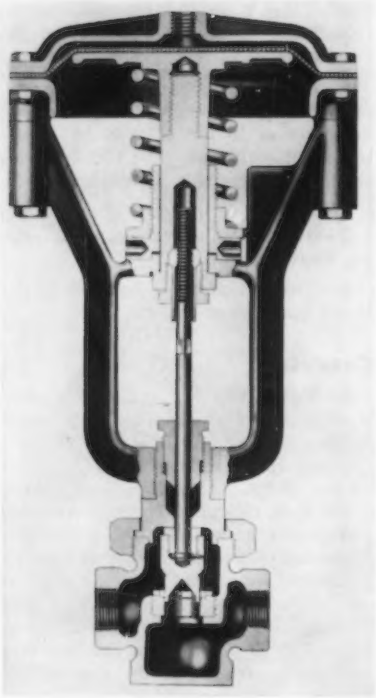
Conclusions

In short, customer application combines the best features of all the methods discussed today and has none of their disadvantages. In fact from an overall standpoint, the more you think about it the more ridiculous it seems to apply non-skid in the box plant. I'm sure that if anyone of us here owned a canning plant, and we made our own boxes for use in that plant and we wanted non-skid on the box, there isn't a doubt in the world at which point the non-skid would be applied—at the end of the line!



"You think this is tough! . . . Heck, you should have been with me and Joe yesterday!"

NEW EQUIPMENT AND SUPPLIES



New Valve Gives Precise Control

A complete line of diaphragm-operated valves, designed for instrument-actuated control of temperature, pressure or flow, is announced by Sinclair-Collins Valve Co.

Featuring exclusive V-port design, said to afford extremely precise modulation of flow because of its tapered variable port area, these valves are offered in both direct and reverse acting types. Intended for steam, air, liquid or gas service up to 250 p.s.i. valves are available in sizes ranging from 1/16 through 2 in. NPT (direct acting) and ⅛ through 2 in. NPT (reverse acting).

Cast valve bodies are of Navy M bronze; yokes and tops are high quality valve bronze. Corrosion-resistant K-monel stem and 18-8 stainless spring are said to assure trouble-free service. According to the manufacturer, the cast Stellite V-port disc and Stellite-faced K-monel seat eliminate wire drawing or cutting, even in severest service. Stem packing is chevron Teflon asbestos.

For further information and descriptive literature, contact Sinclair-Collins Valve Co., 454 Morgan Ave., Akron 11, Ohio.

Syphon System Extracts Water at Suction Boxes

An improved syphon system has been developed by Poirier Control Co., Waterville, Maine, for automatic water extraction and control of vacuum at the flat suction boxes of fourdrinier machines. Its use is said to permit increased production, higher operating speeds, superior formation and longer wire life.

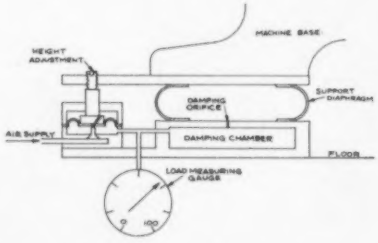
Designated as the Baromatic Syphon system, it consists of a header coupled through a manifold and flexible couplings to the flat suction boxes. Vacuum is provided by seven barometric legs and a small auxiliary source of vacuum.

The number of drop legs in use at any given time is dependent upon the volume of water carried by the sheet to the suction boxes. Drop legs automatically cut in and out of operation as the volume of water increases or decreases. With this method, water extraction capacity varies automatically, as required, to maintain constant moisture content of the sheet.

Benefits reported for the Baromatic system include lower steam consumption by the driers, and power savings due to the elimination of large vacuum pumps.

Air Columns Support Heavy Machinery

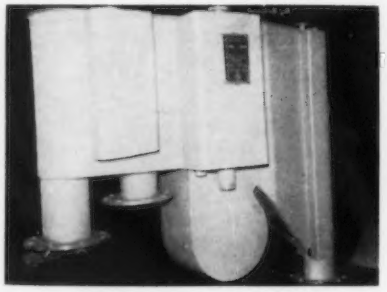
Basically a simple air container of nylon-reinforced neoprene and cast aluminum, fitted with a pressure indicating gage, the Weber Air-Mount is the means to an entirely new and very efficient machine-mounting system.



In use, a unit is placed under each support point of a machine and connected to the factory air supply. The units virtually become part of the machine they support and remain with it while it is in service. The machine is actually supported on columns of air with no rigid connection between it and the floor. Pressure gage readings indicate machine weight supported by each unit. This is possibly the most important feature of the Air-Mounts since it is the only way of knowing each support point is carrying a fair share of the load.

The cushions of air isolate the machine from outside vibration and minimize those which may develop within the machine itself. According to the manufacturer, a system of Air-Mounts eliminates the need for special foundations, thereby considerably reducing the cost of a large percentage of heavy machinery installations. The units are designed to support and indicate loads from 500 to 12,000 lbs. each with a 100 p.s.i. air supply. They are light in weight and easily handled by one man in making installations. The device has practically a limitless life and can be moved from one machine to another.

The Air-Mount is manufactured and distributed by the Weber Instrument Co., 11301 Schaefer Road, Detroit 27, Mich.



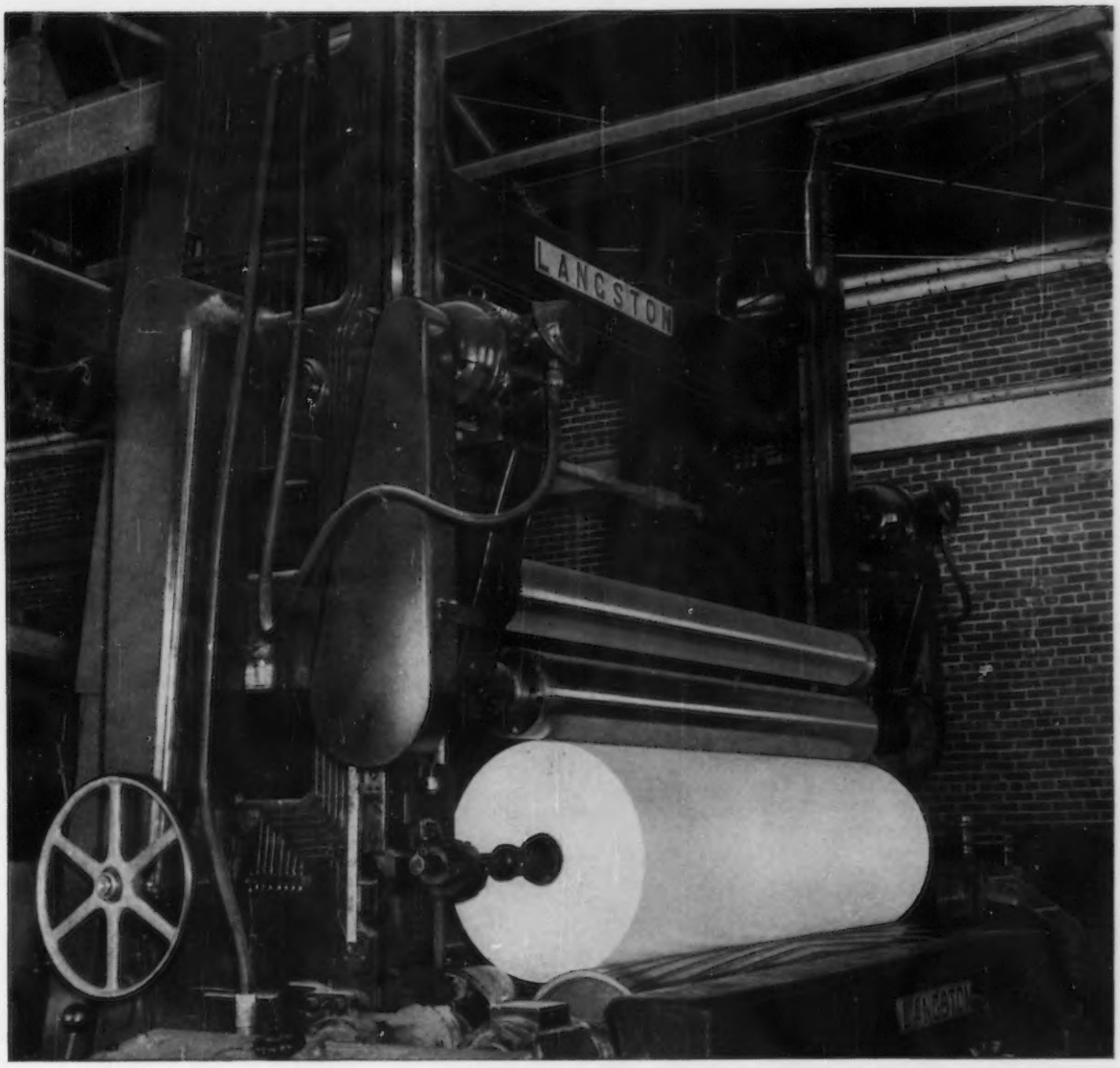
Accurate Regulation of Consistency, Basis Weight

The Poirier Control Co. is now marketing commercially a new counter-flow consistency and basis weight regulator for application in fourdrinier and cylinder machine, pulp mill, and refiner operations. Reported to control consistency within 1/10th of one per cent and basis weight within two per cent, it may be successfully applied to all grades from 8-lb. tissue to 270-lb. kraft liner boards.

Featuring automatic operation, the regulator uses a constant head dilution system to maintain basis weight and consistency. The dilution arrangement is free from line pressure surges and changes.

Constructed entirely of stainless steel, nine models are available to control production from four to 1000 tons per day. Special regulators are available for control of very dilute consistencies.

Operational details on this unit may be obtained from Poirier Control Co., Waterville, Maine.



Langston Slitter and Winder features precision roll density control

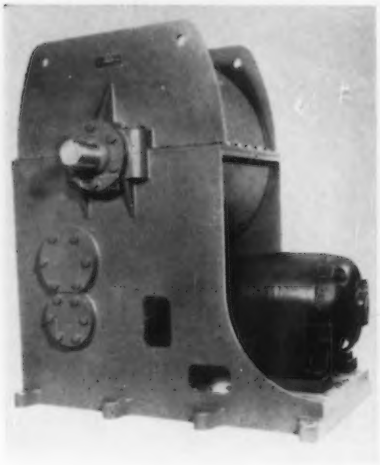
Here's a way for you to get uniform roll density from the core to the outside. This type "DH" Slitter and Winder features hydraulic rider roll control that automatically adds or subtracts rider roll weight.

This arrangement makes it possible to constantly maintain correct nip pressure to compensate for the changing diameter and weight of the rewound roll. A simple valve permits setting the correct rider roll weight for various grades and basis weights of both paper and board.

Pushbuttons for raising and lowering the rider roll during threadup replace complicated chains, sprockets, and bulky counterweights, thus speeding up production by reducing setup time.

Learn more. Write SAMUEL M. LANGSTON Co., 6th & Jefferson Sts., Camden 4, N.J.

LANGSTON *Leadership...by design*



Less Space Required with New Type Drive Units

A new line of heavy duty speed reducers and load supporting type flexible couplings were recently introduced by the H. W. North Co. at the Chemical Exposition in New York. Designed and developed for driving all kinds of heavy rotating machinery at low and medium speeds, both parallel shaft and right angle type units are being offered for severe service applications in A.G.M.A. ratings up to 1500 h.p. These new Unicentric drives are now available in single and multiple reduction models representing a wide range of standard ratios and output speeds.

According to the manufacturer, these improved drive units have greater capacity for space occupied than almost any other type of commercial speed reducer. High operating efficiency is said to be assured through the use of precision cut helical gears which are straddle mounted between heavy duty roller bearings on large diameter alloy steel shafts.

Further details may be obtained from H. W. North Co., P. O. Box 9051, Birmingham 9, Ala.

Heat Exchanger Tubes Available

Commercially available Pyroceram brand tubing was recently announced by Corning Glass Works, Corning. N. Y. Tubing, in diameters ranging from ⅛ to ¾ inches will be available in quantity after the first of the year for broad industrial applications such as heat exchangers and, as diameters increase, process piping, the company stated.

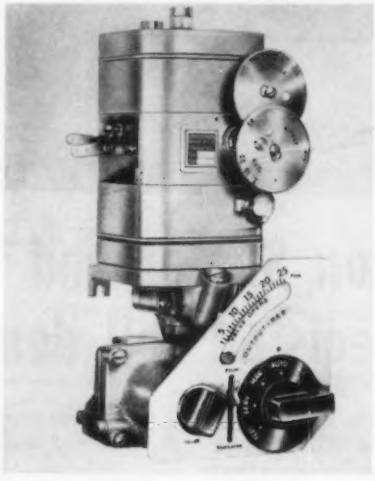
The tubing is pure white and opaque, with the thermal shock resistance equivalent to that of fused silica. Pyroceram brand heat exchanger tubes will materially extend the operating range of present Corning units. Pyroceram tubing in heat exchangers, is said to permit higher rates of heat flow per unit area. allow higher operating pressures, and considerably lessen any chance of damage to the unit by abrasive particles.

Improved Design Cylinder Mold Introduced

A cylinder mold of new and improved design has been introduced by Layton-Greenfield, Inc. of Coatesville, Pa., designers and builders of paper manufacturing machinery.

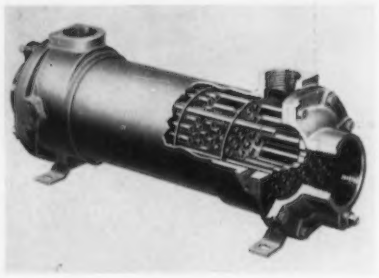
The mold, which is built on heavy cast iron centers, is said to differ in a number of important respects from conventional cylinder molds. Their advanced design offers greater overall strength and longer life without increase in cost. In addition, a new and stiffer type of spider design supports heavier rods and permits greater tensioning of the wire wrapping. Removable chime rings simplify maintenance and replacement.

A series of standard designs up to 14 feet, face and diameters of 30, 36, 42 and 48 inches are available, and special designs to meet unusual operating conditions can be quoted on request. Rod and wire material can be supplied in stainless steel or bronze to meet individual customers' specifications.



Pneumatic Controller

Improved motion-balance pneumatic controller with a unique "regenerative feedback" circuit introduced by Fischer & Porter Co., 255 Jacksonville Road, Hatboro, Pa. The new Model 53-P controller handles both pneumatic and mechanical signals simply by changing one sub-assembly.



Compact, Versatile Heat Exchangers

An expanded line of Type BCF Exchangers, with improved performance, new design features and new materials is now available at lower prices, announces Ross Heat Exchanger Division of American-Standard.

Described as "a big step forward in the continuing refinement of this compact, standardized exchanger," the 1958 BCF is now offered in 46 sizes; one, two and four pass designs; and 1.2 to 124 sq. ft. of heat transfer surface. Fully pre-engineered and carried in stock, the new line embodies numerous improvements, including: New baffle structure with flanged lip at each tube hole and around outer edge to give tighter tube fit and improved thermal characteristics; stamped steel feet movable in three positions around hubs for easy, more adaptable mounting; hubs relieved under connections for unrestricted flow; corrosion resistant copper alloy core assembly and rugged cast iron bonnets.

The units are designed for cooling lube oil, jacket water, hydraulic and other fluids, as well as many process heating applications. Complete information can be obtained from Ross Heat Exchanger Division of American-Standard, Buffalo 5, N. Y.

Circuit Breakers Feature Three-Position Design

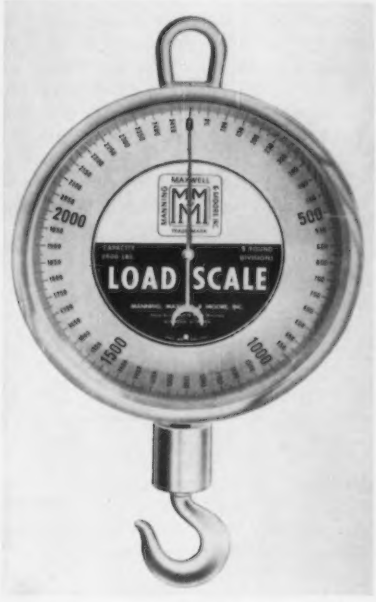
A new (Type DB) 600-volt, 15- to 4000-amperes, metal-enclosed switchgear with three-position breaker design is now available from the Westinghouse Electric Corp. The interrupting rating of the units are from 15,000 to 100,000 amperes.

The three position feature (connected, test and disconnected) offers additional convenience and safety to operating and maintenance personnel, and greater protection for the circuit breaker. Other advantages include: (1) free aisle space regardless of breaker position; (2) disconnected breakers while maintaining equipment controlled; and (3) easy recognition of breaker position.

The trip action on the DB-25 and DB-50 is now accomplished by a sep-

arate push button. The trip button is protected on both sides by fixed guards so that accidental operation is minimized and both guards are provided with slots enabling padlocks to be applied to hold the mechanism trip-free. The basic breakers, disconnecting contacts and interlocks with the housings, have not been changed. Hence, in emergencies existing space breakers could be used in the new three-position housings, or a new three-position breaker could be used in the older housings by removing the sliding trimplate.

For further information, write Westinghouse Electric Corp., P. O. Box 2099, Pittsburgh 30, Pa.



New Load Scale Saves Time

Shaw-Box Crane and Hoist Division of Manning, Maxwell & Moore Inc., Muskegon, Mich. has announced the marketing of its new line of MMM load scales. The scale is precision made and is accurate to within 2/10ths of one per cent of the full scale reading. The mechanism is sensitive to weight changes of less than ½ of one division. It weighs only 42 pounds, but is ruggedly constructed to withstand rough usage. It is unaffected by heat or cold within normal temperature ranges.

These load scales substantially reduce handling costs where materials must be weighed. Picking materials up, moving them to a stationary scale, setting them down, recording their weight and then picking them up again means double handling and increased labor cost. With the MMM load scale, weighing and handling are performed in one time-saving operation.

Low Cost Handling with New Lift Truck

A non-powered lift truck system that features a hand lift jack for use with any number of semi-live skid platforms is offered by the Hamilton Caster & Mfg. Co. Designated as the Roll-N-Stor system, it consists of a lift jack with a pintle that instantly engages a special bracket under the front of the skid. A forward pull of the jack handle raises the legs of the skid off the floor and the unit is ready to roll. When empty, the skids can be stored on end in a small area.

Designed for rugged service, the lift truck system meets the need for flexible, low cost handling in warehousing, distribution, industrial, and mill operations. The lift truck is simple to operate and requires almost no maintenance.

Additional information is available from the Hamilton Caster & Mfg. Co., 1700 Dixie Highway, Hamilton, Ohio.

228 years experience
in Kraft paper at the new Dierks plant!

The supervisory personnel at the new Dierks Paper Company's mill at Pine Bluff, Arkansas, have a combined experience in Kraft paper production of 228 years. For this plant there is available an assured supply of wood and chips from the Dierks Tree Farms in Arkansas and Oklahoma, one of the largest bodies of privately owned timber under expert forestry management in the nation.

Experienced personnel, working in this modern Kraft mill with a virtually inexhaustible supply of wood, assures the paper trade of a steady, dependable source for quality Kraft paper and liner board.

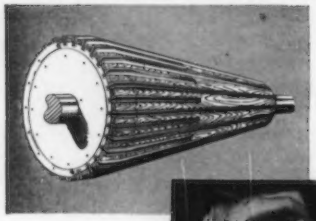
Now in production — your inquiries are invited!

Dierks Paper Company

Frank Johnson, Sales Manager
810 WHITTINGTON AVE. HOT SPRINGS, ARKANSAS
A DIVISION OF DIERKS FORESTS, INC., LARGEST MANUFACTURER OF SOUTHERN PINE LUMBER

TIME FOR REPLACEMENT?

Jones® Adapta-Plug



Strongest plug design yet developed, this new completely bandless Jordan plug is easiest to strip and fill. New, improved design holds bars firmly in place, eliminates hazards of slot wear and corrosion. Available in solid plug — or sleeve form for easy conversion of old worn plugs. Write for Bulletin EDJ-1094.

Jones® FULBAR SHELL FILLINGS

A complete one-piece assembly, made to fit the shell body of any Jordan. No keys or wedges. Fulbar rigidity and one-piece construction compensate for inequalities in old Jordan shells — save hours of installation time. Many other new advantages make this the ideal shell filling. Write for Bulletin EDJ-1094 and names of satisfied users.

E. D. JONES & SONS COMPANY
Pittsfield, Massachusetts

Builders of Quality Stock Preparation Machinery

In Canada: The Alexander Fleck, Ltd., Ottawa

Split-Level Mixer More Effective

Exhibited by Rand Standard at the Chemical Exposition in New York was a 150-gallon split-level mixer, designed for use in the paper, plastics, paint and other chemical industries.

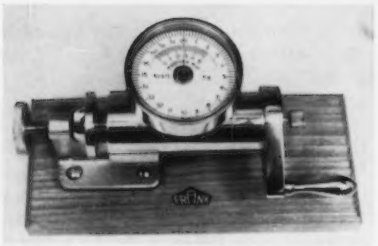
Said to provide more effective mixing and heat transfer area, the mixer was developed to provide complete dispersion of high density, high viscosity chemical ingredients. It is also available in 350, 750 and 900-gallon sizes.

Also exhibited at the exposition was Readco's new continuous double arm mixer, built to provide homogeneous mixes of most materials, including those of high density or high viscosity, on a continuous basis.

For more information write Read Standard, York, Pa.

Portable Unit Tests Burst Strength

An improved, hand-operated unit for testing burst strength of paper and board is now available from Germany. Simple to operate, easily portable, the



apparatus permits determination of strength in a minimum of time.

Test procedure is such that a circular paper sample is clamped in place and ruptured by clockwise rotation of a handle. The pressure required to rupture the sample as well as maximum convex height are indicated on an attached gage. Bursting strength is indicated on a scale graduated from 0 to 20 kg. at intervals of 0.2 kg. Maximum convex height is indicated in mm. The mechanism is returned to a zero setting by counter-clockwise rotation of the handle.

Further information may be obtained from Karl Frank G.m.b.H., Weinheim-Birkenau, Germany.

OBITUARIES

C. W. Loomis, retired director and vice-president of the Bemis Bro. Bag Co., died December 19 following nearly two years of ill health. He was director of personnel at Bemis' St. Louis general offices at the time of his retirement in January, 1957.

A graduate of the Massachusetts Institute of Technology, Mr. Loomis joined the Bemis organization in Boston in 1916, transferring to the St. Louis Engineering Department in 1920. He transferred to the company's Indianapolis sales division in 1922 as a salesman and in 1924 was put in charge of the Detroit sales office.

Mr. Loomis was made manager of the Bemis Memphis plant and sales division in 1931, serving in that capacity until 1947 when he was transferred to St. Louis as director of personnel. He was elected a vice-president in 1949 and a director of the company in 1952.

F. B. Bjornlund, widely known retired pulping expert, died on December 18th in Montreal. Mr. Bjornlund who was born and educated in Sweden came to this country in 1929 to work at the old Algonquin mill at Ogdensburg. He next spent many years at the Brown Co. mill in LaTuque, Que. During the war he moved to the Howard Smith Paper mills at Cornwall, Ont., as superintendent of pulp mills where he remained until his retirement five years ago.

Edward J. Sullivan, 56, manager fine papers department of Bowater Paper Co. Inc., New York, died suddenly December 17.

John J. Sullivan Jr., 66, of Holyoke, died December 20 in Brookline, Mass.

For many years he operated his own business in the pulp and paper brokerage field in Holyoke Mass. And for some time was sales representative of the Groveton Paper Co., Groveton, N. H.

Max Bartush, 62, one of the original group of papermakers in 1913 put the Fort Frances, Ontario, mill into production, succumbed to an illness December 16. He retired as boss machine tender in June of this year due to ill health.

William Strong, 49, superintendent of Mac-Sim-Bar Paper Co., Otsego, Mich., died Dec. 12 of a skull fracture suffered in an automobile accident.

ALBACEL & ASTRACEL

CHLORINE DIOXIDE BLEACHED SOFTWOOD SULPHATE

CHLORINE DIOXIDE BLEACHED HARDWOOD SULPHATE

Balanced Paper-Grade Pulps Created by Papermakers for Papermakers

Throughout the free world, papermakers use and like Riegel's Albacel and Astracel . . . paper-grade pulps that provide the right balance of all important qualities: brightness, cleanliness, strength, formability and proper beating characteristics.

RIEGEL PAPER CORPORATION

260 MADISON AVENUE, NEW YORK 16, N. Y.

Program for January Meeting of CPPA Technical Section

The 1958 annual meeting of the Technical Section, Canadian Pulp and Paper Association, will be held at the Sheraton-Mt. Royal Hotel, Montreal, on January 29, 30 and 31. The following is a tentative program.

Tuesday Evening, January 28
ADVANCE REGISTRATION

Wednesday Morning, January 29
REGISTRATION
SESSION "A"

"The Inter Relation of Research with Manufacturing, Sales and Management." Panel Moderator, W. Gallay, The E. B. Eddy Co. Panel Members: F. L. Allen, Canadian International Paper Co.; D. W. Ambridge, Abitibi Power & Paper Co. Ltd.; A. C. Hill, Anglo Paper Products Ltd.; C. A. Sankey, The Ontario Paper Co. Ltd.

TECHNICAL SECTION BUSINESS MEETING
Wednesday Afternoon
SESSION "B"

1—The Relationship Between Pulp Quality and Alkali Concentration, by C. B. Christiansen and G. W. Legg, Pulp & Paper Research Institute of Canada.

2—Control for Wood Weight and Moisture Variation for Alkaline Pulping of Deciduous Woods, by H. M. Banfill, J. G. Wheeler and J. M. Ferguson, Howard Smith Paper Mills Ltd.

SESSION "C"

"Future Trends in the Manufacture and Use of Printing Paper."

A panel discussion to include the following short presentations:

1—Fine Papers from the Paper Machine Builder's Viewpoint, by D. R. Simonds, Beloit Iron Works.

2—Where Are We Going in Printing Press Design, by R. P. Tyler, Harris-Seybold Co.

3—What the Printer Wants and Expects from the Fine Paper Supplier, by A. Beecroft, Rolph-Clark-Stone Ltd.

4—Papermaking—Some Fundamentals, by H. Williamson, Paper and Paperboard Consultant.

5—Fine Papers from the Papermaker's Viewpoint, by S. J. Leishman, Provincial Paper Ltd.

SESSION "D"

1—Mixed Stock Control System at Mersey Paper Co. Ltd., by H. A. Paterson and E. Hazeldine, Mersey Paper Co. Ltd.

2—Comparison of Twinder Air Bleed and Standard Pressing Installation at Great Northern, by D. Pollard, Great Northern Paper Co.

3—Panel Discussion: Vacuum Transfer Operating Problems on New Machines.

Thursday Morning, January 30
SESSION "E"

"Hydrodynamics of the Fourdrinier Wet End"

1—The Hydrodynamic Behavior of Papermaking Fibers, by D. R. Forgacs and S. G. Mason, Pulp and Paper Research Institute of Canada.

2—Drainage at a Table Room and a Foil, by G. I. Taylor, F. R. S. This paper will be read by C. I. H. Nicholl, Laval University.

3—Determination of Fiber Orientation in Paper, by H. Ruck and H. A. Kraessig, Industrial Cellulose Research Ltd.

4—Tosylchloroamide Degradation of Pulp Materials, II: Characterization of Dissolving Pulps, by T. N. Kleinert and R. M. Dlouhy, Pulp & Paper Research Institute of Canada. (By Title)

SESSION "F"

1—The Pulping of Mechanically Treated Wood, I; Sulphite and Neutral Sulphite Pulping of Crushed Spruce, by J. E. Stone and L. F. Nickerson, Pulp and Paper Research Institute of Canada.

2—Pulp Production with Sodium Bisulphite, Part I: The Cooking of Spruce, by R. M. Dorland, R. A. Leask and J. W. McKinney, Abitibi Power & Paper Co. Ltd.

3—The Magnefite Process—A new Pulping Method, by G. H. Tomlinson, G. H. Tomlinson II, J. R. G. Bryce and N. G. M. Tuck, Howard Smith Paper Mills Ltd.

GROUP DISCUSSIONS
Electrical Engineering

Group discussion to be led off by the paper "The New Electrical System at Anglo," by C. A. Laverty, Anglo-Canadian Pulp & Paper Mills Ltd.

Thursday Afternoon
SESSION "G"

"Hydrodynamics of the Fourdrinier Wet End" (cont'd)

1—An Investigation of Hydraulic Pressure Pulsations in Wet-End Piping of a Paper Machine, by N. M. Reitzel, Rice Barton Corp.

2—The Hydrodynamics of Approach Piping for Paper Machine Headboxes, by J. Mardon, P. B. Wahlstrom and G. O'Bleenes, Anglo Paper Products Ltd.

3—Investigation of Wet End Flow Problems, by A. R. Murphy and G. H. Webster, Industrial Cellulose Research Ltd.

4—The Effect of a Simple Surge Tank on Pressure Oscillation in a Pipe Line, by W. D. Baines, National Research Council.

SESSION "H"

1—A Survey of Current Sulphite Mill Instrumentation, by A. L. Mills and J. L. Barron, Bowater's Newfoundland Pulp & Paper Mills Ltd.

2—Automatic Control of Pulp Chlorination with an O. R. P. Meter, by W. H. Bush, Gaspesia Sulphite Co. Ltd.

3—Panel Discussion: The Instrument Department—Its Place in the Mill Organization.

GROUP DISCUSSIONS
Board

Panel Discussion: The Cleaning of Board Stock

Mechanical Pulping

1—Refining Low-Cost, High-Production Groundwood with a Double-Disk Refiner, by W. H. de Montmorency, Pulp & Paper Research Institute of Canada.

2—Discussion of Operating Problems.

Thursday Evening
TECHNICAL SECTION DINNER

Friday Morning, January 31
SESSION "I"

1—Determination of the Optimum Size of Stock Chests, I: The Ideal Chest, by A. Cholette, Laval University and O. J. Walker, Anglo-Canadian Pulp & Paper Mills Ltd.

2—Side Entering Propeller Mixers in Vertical Cylinder Stock Chests, by J. Y. Oldshue, Mixing Equipment Co. Inc., and A. T. Gretton, Greey Mixing Equipment Ltd.

3—Panel Discussion: with R. L. Elderkin, Consolidated Paper Corp. Ltd.; A. M. Hurter, Stadler, Hurter & Co., and R. M. Stuart, Ste. Anne Paper Co., as well as Drs. Cholette and Oldshue serving on the panel.

SESSION "J"

1—How do you Plan the Handling System?, by J. W. Hall, Westinghouse Electric Corp.

Courtesy of Republic Steel Kitchens

GLIDDEN Alpha® Protein...

IMPROVES QUALITY, SPEEDS PRODUCTION, REDUCES COST!

Every day, more mill operators are specifying Glidden Alpha Protein, the largest selling adhesive for high-solids coated offset paper. The reason? They report that the controlled product quality, faster machine speeds and higher coat weights improve their product, reduce production costs.

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Glidden Alpha Protein dries rapidly, permits faster machine speeds with production increases up to 15%. And, the extra heavy solids coating possible with Alpha Protein means heavier coat weights and smoother, more uniform sheets.

Investigate the application of Glidden Alpha Protein in your coating operation. It can return big dividends. Write or call for complete information.

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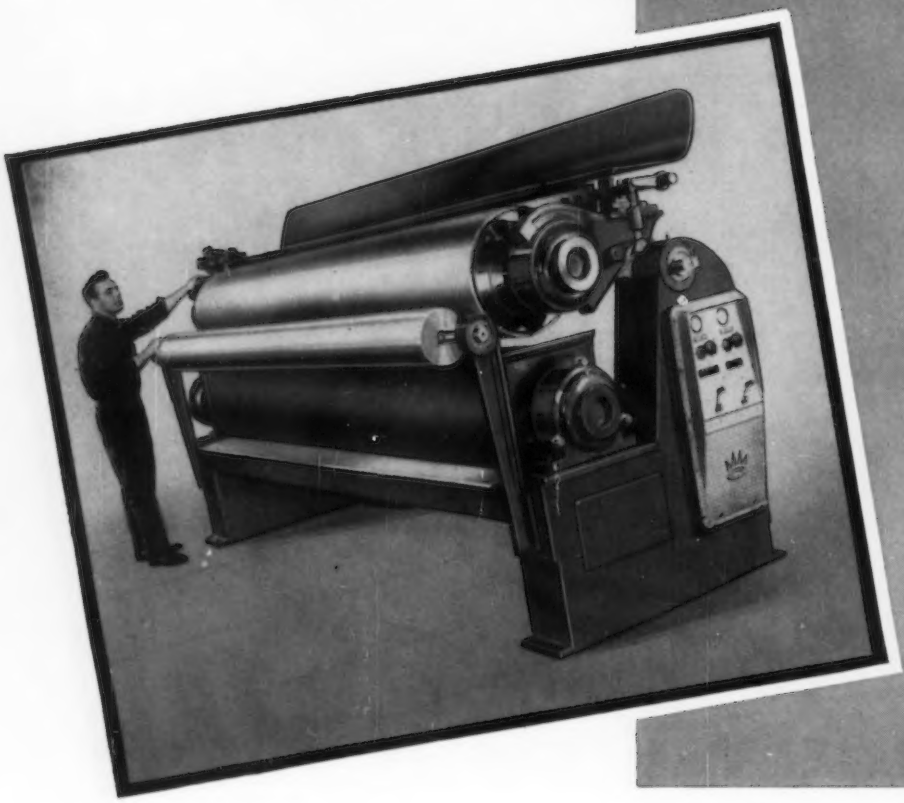
MODERN PRESSES *require* MODERN DOCTORS



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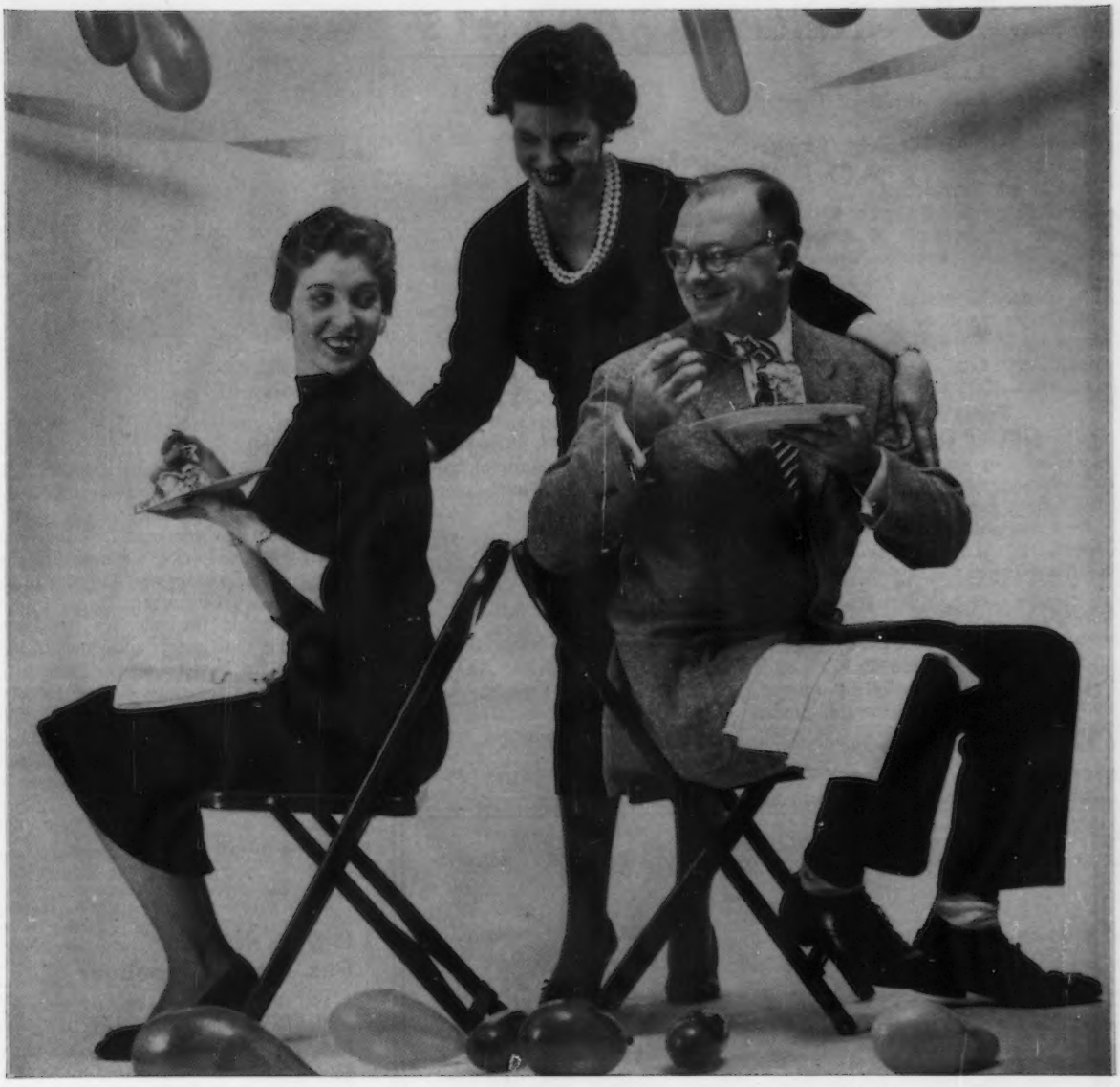
You can be sure if it is LODDING.

On this Manchester Machine Company size press only LODDING could match the quality of the machine.

LODDING ENGINEERING CORPORATION

WORCESTER, MASSACHUSETTS



COLUMBIA-SOUTHERN CHLORINE: *matchmaker at work*

Every town, and often neighborhood, has its inveterate matchmaker. With economical precision of insight, the matchmaker pairs the young . . . and sometimes not-so-young . . . into couples. Shy youngsters are gently prodded from their corners, the too enthusiastic cunningly curbed, the "not interested" patiently taken in hand.

Day after day in plant after plant, Columbia-Southern chlorine steps in to smooth problems in processing "romance." Compound C just can't tolerate Compound F . . . Compound XY won't be nudged into a molecular change . . . Compound Z refuses to alter its awkward form! Only until the transforming touch of chlorine, working through oxidation, addition, or replacement reactions, so quickly creates the favorable conditions needed.

Columbia-Southern chlorine *is* uniquely adept at this vital matchmaking. Its history begins with our extraction of the purest brine from wells thousands of feet deep, continues through painstaking separation in the world's most modern facilities, reaches its peak in delivery to you by such Columbia-Southern pioneered improvements as fusion-welded tank cars or inland waterways barge fleets.

So as your requirements for chlorine grow, why not contract with the country's leading, most experienced merchant producer? Contact Columbia-Southern today for chlorine that matches wits with your *processing*, not with you.

COLUMBIA-SOUTHERN CHEMICAL CORPORATION
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Dallas • Houston • Pittsburgh • Philadelphia
San Francisco

IN CANADA: Standard Chemical Limited and its Commercial Chemicals Division

2—How We Handle Paper in the Warehouse, by W. E. Crotty, Time, Inc.

SESSION "K"

"Vacuum Requirements of Paper Machines"

1—Vacuum and Capacity Requirements of Paper Machines, by F. W. Green, Nash Engineering Co.

2—A Machine Builder's Views on Vacuum Requirements of Paper Machines, by M. Papesh, Beloit Iron Works.

3—Panel Discussion.

4—Stress Analysis of Suction Roll Shells, by R. L. Elderkin, Consolidated Paper Corp. Ltd.

Friday Afternoon

GROUP DISCUSSION

Electrical Engineering and Newsprint

1—Newsprint Winder Drives, by F. E. Thouret, Price Bros. & Co. Ltd.

2—Papermaker's Views on Winder Drives, by J. A. McLean, Great Northern Paper Co.

Sulphite

"Effect of Wood Deterioration on Pulp Quality and Yield"

Discussion will be led off by a paper by T. G. Sheridan, Howard Smith Paper Mills Ltd.

MERCHANTS

Spokane Firms Announce Merger

Merger of Spokane Paper and Stationary Co. and Guy W. Plank Co. has been announced by heads of the two firms.

The new firm will be called the Spokane Paper and Stationery company.

Spokane Paper has been wholesaler of building materials, floor coverings, electrical housewares and paper products since 1906. The Plank Co. is the Inland Empire distributor of appliances which will be included in the new operation.

Delaware Firm Incorporates

Haberman Paper Sales Inc. filed a charter of incorporation with the corporation department of the secretary of state's office, Dover, Del. Officers of the newly-organized firm, which will be engaged in the sale of paper, paperboard and allied products, are Charles T. Haberman, president; A. S. Haberman, vice president, and Helen S. Haberman, secretary-treasurer. Principal office of the company is located at 2706 Jefferson St., Wilmington, Del.

Two Syracuse Firms Bought, Merged

McAuliffe Paper Co. and the State Tablet Co., Syracuse, N. Y., have been sold to Harold D. Burrows who will operate the businesses under the name of McAuliffe Paper Inc.

The sale was announced by the First Trust & Deposit Co., executors of the will of the late James R. McAuliffe who died last December.

Included in the sale are the land, buildings, machinery and inventories.

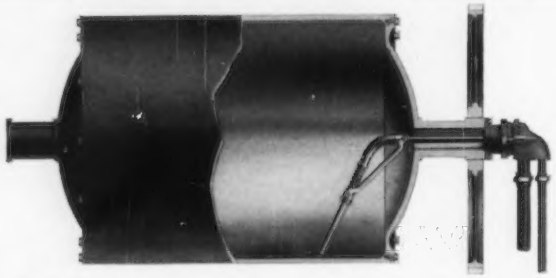
The State Tablet Co. was formed in 1930, manufacturing school tablets, fillers, ruled and plain ream papers and pads to supply paper jobbers and school supply distributors, as well as industrial plants throughout New York State. A few years ago, the jobbing of paper products was discontinued, and the business turned entirely to manufacturing.

B & P Names Des Moines Manager

Hal Smith has been named manager of the Des Moines division of Bermingham & Prosser Co. He was formerly assistant sales manager of the Kansas City division of B&P, and in addition to sales management has had prior experience in selling and merchandise buying. He has been with the company ten years.

Industrial Papers Change Name

Industrial Papers, Inc has changed its name to the J. C. Campbell Paper Co. of Worcester. The change in name is designed to serve both as a memorial to the company's founder, James C. Campbell, and also mark its growth in both the fine and coarse paper fields with divisions and warehouses in Pawtucket, R. I., Brockton and Worcester, Mass., and Manchester, N. H. The telephone number, address (400 Canal St., Manchester, N. H.), personnel and management remains the same.



ENGINEERED TO STAY PUT

The Midwest Auto-flex Syphon features a spring and brace that holds the end of the pipe at the proper distance from the bottom of the dryer. The pipe cannot possibly take any other position —hence, proper water and air removal.

The cantilever leverage exerted is less than half that exerted by bent pipe syphons. In the Midwest, the pipe clears the dryer and creates no drag on the journal. Fits all steam joints and remains effective at low as well as at high operating speeds.

Order a few for trial and quit worrying about syphon troubles.

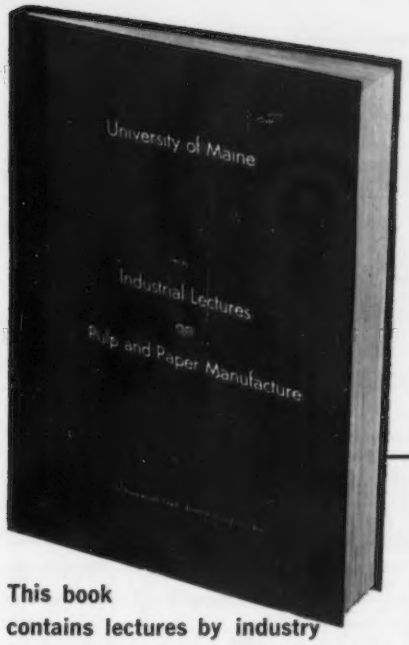
ROSS MIDWEST FULTON CORP., Dayton, Ohio, U.S.A.

Subsidiary of J. O. Ross Engineering Corp., New York, N. Y.

Representatives:

James Brinkley, Seattle; Clark & Vicario, North Tarrytown, N. Y.;

Ross Engineering of Canada Limited, Montreal.



Industry specialists authored this practical textbook on pulp and paper production...

University of Maine professors edited it...

Now the publishers offer it to pulp and paper mill men at reduced price.

The *University of Maine Lectures*, Series II, contains 373 pages of up-to-date material covering a broad field in both pulp and paper making and including many fine illustrations and diagrams. The book was edited by Professors Lyle C. Jenness and John Lewis of the University of Maine.

The *Lectures* can be used as a textbook to train foremen and to orient engineers entering the field. Executives, superintendents, engineers and chemists will also find this book invaluable. Every mill should have one or more copies for quick reference to provide figures, process details, and information indicated by subject file at left.

Thousands of these textbooks have been sold at the original price of $7.50 per copy. Now, because the publisher is moving to new offices, you can buy the same book, bound in cloth with gold lettering on cover, for the special price of only $5.00, postage prepaid. This offer applies *only* to mills and mill employees, and is for a limited period.

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This book contains lectures by industry authorities on the following subjects:

PULP SECTION

The Structure of Wood
Chemistry of Cellulose and Wood
The Wood Supply
Preparation of Wood
The Wood Room
Manufacture of Groundwood
Mechanical Pulping
Grinders and Grinding
Cooking Acid Preparation in the Sulfite Process
Sulfite Pulping Sulfur Dioxide Preparation
Sulfite Acid Preparation
Sulphite Pulp Acid Making Systems
Cooking Sulphite Pulp
Sulfite Pulping
Neutral Sulfite Semi-Chemical Pulping
Soda Pulping
Kraft Pulping
Sulfate Recovery Units
Chemical Recovery Unit
Peroxides
Peroxide Bleaching
Chlorine Bleaching
Corrosion-Resistant Metals for Pulp and Paper Industry
Application of Chemical Engineering To Pulp and Paper Technology

PAPER SECTION

Waste Paper, Its Collection and Usage
Facts Concerning the Waste Paper Industry and Its Relationship to Pulp in the Paper and Paperboard Industries
Beating and Refining
Stock Preparation
Fillers and Loading
Paper Fillers
Starch Sizing of Paper
The Dyeing of Paper
Coarse Papers Bag and Board
Coarse Papers
Sanitary Tissues
Instrument Applications in Pulp and Paper Mills
Fourdrinier Paper Machines — Wet End
Paper Machine — Wet End
Fourdrinier Paper Machines — Dry End
Paper Machine Drive Fundamentals
Drying Theory and Practice
Paper Coating
Paper Testing and Specifications
Paper Converting
Finishing and Converting
Graphic Arts

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NEWS OF

SUPPLIERS

J. E. Irvine

R. J. Proctor

Bauer Bros. Co., Springfield, Ohio, announced the appointment of James E. Irvine as assistant director of engineering and Robert J. Proctor as administrative assistant to director of engineering.

Mr. Irvine was formerly vice president and chief engineer for Condi Engineering Corp., Pittsfield, Mass. and previously was with Abitibi Power and Paper Co for 14 years.

Mr. Proctor, before joining the Bauer, was assistant to the president of the Eaton-Dikeman Co., Mount Holly Springs, Pa. Prior to that, he was general manager at West Jersey Paper Manufacturing Co., Camden, N. J.

Allis-Chalmers Manufacturing Co. announces that R. E. Morris, manager of industrial sales for the Industries Group in Washington, D. C. office for the last year, has been appointed manager of the Group's St. Louis district succeeding J. C. Lovelace, resigned.

Alvin C. McCully

Samuel M. Langston Co., has advanced Alvin C. McCully to sales engineer and assigned him to eastern territory. Langston are manufacturers of corrugated shipping container machinery and paper mill slitters and winders.

Mr. McCully joined Langston as a sales assistant in May 1956. He previously worked as a mechanical engineer in pneumatic control systems for Conoflow Corp., and in the expansion and development department of the N. J. Electric Co.

Mr. McCully studied mechanical engineering at Duke University, Florida University and the U. S. Naval Academy.

Charles Hodgdon

DeZurik Sales Co., announces the appointment of Charles Hodgdon as eastern regional sales manager, effective January 1. A new office has been opened at 24 Franklin Place, Summit, New Jersey. DeZurik Sales Co. is the sales and service organization for DeZurik Corp. of Sartell, Minnesota, manufacturers of consistency regulators and valves.

Mr. Hodgdon has been a sales engineer for the DeZurik Corp., traveling in New England and part of New York state. In his new position he will be traveling to the same area plus eastern Pennsylvania and Maryland, as well as the mills in the New York-New Jersey area.

Pittsburgh Plate Glass Co. disclosed today that it will build one of the world's largest continuous fiber glass yarn plants at Shelby, N. C. A multi-million dollar plant, the new unit will employ approximately 850 persons at capacity operation.

Daniel Construction Company, of Greenville, South Carolina, has been selected as general contractor.

Morningstar, Nicol, Inc., has elected Nicholas J. Mead treasurer and a director. For the past seven months, Mr. Mead has been acting treasurer of the company.

Kidder Press Co., Dover, N. H., announces that Russell Mandeville has joined its New York City staff. He is to act as advisor to customers on the most effective operation of Kidder presses.

Just prior to joining the Kidder staff he was production superintendent at Papercraft Corp.

Allied Chemical & Dye Corp. announce the retirement of Karl Ivar Ekholm, veteran paper dye salesman and sales executive of National Aniline Division, as of December 31, 1957, Mr. Ekholm, assistant director—dyestuff sales, has been with the company for the past 34 years.

Warren K. Guy

Link-Belt Co., is opening a new district sales office in a new office building at 2025 Canal St., New Orleans 16, with Warren K. Guy as district manager. The office will bring to 40 the network of the company's district sales offices.

R. J. Tricon Co., Link-Belt industrial distributor in the New Orleans area for many years, will continue to maintain large stocks of Link-Belt products to serve industry in the area.

Allied Chemical & Dye Corp. have announced the appointment of H. G. Phillipps, Jr. as manager, Syracuse sales branch, Solvay Process Division. Mr. Phillipps succeeds William E. Hess who retired December 31st after 27 years as Syracuse sales branch manager.

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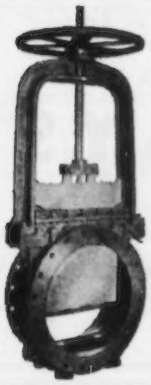

RECORD PAPER & PULP STOCK VALVES "BONNETLESS" SELF CLEARING---"RESIDUE POCKETLESS TYPE"

METALS — I.B.B.M. all iron, bronze or stainless steels, body parts plain or rubber lined.

The photo of 24" Fig. 241 I. B. B. M. valve while illustrating the gate bottom wedge system for forced gate seating and "GUILLOTINE" edge for shearing fibre at seat also shows the packing box and yoke as separate units. Both adjustable.

- **The "FAST THREADED" screw stem and ball bearing speeds valve operation.**
- **The packing box is extra deep, is adjustable and provided with specialized lubricated packings and special type gland and compression bolts.**
- **The yoke mountings are such that yokes for various methods of gate operation are interchangeable.**
- **Replaceable gate edge shoes are used in valves 10" and larger. These shoes are of special value when valves are installed stem and pipe horizontal.**

"RECORD PRODUCTS EXTENSIVELY USED IN DEFENSE PROJECTS"

RECORD FOUNDRY & MACHINE COMPANY

LIVERMORE FALLS, MAINE, U. S. A.

HOP ON THE JENKINS' METLKOR BANDWAGON

You'll have plenty of company for Paper Mill men everywhere are using Jenkins' METLKOR Brushes for every brushing application. They're built better to perform better and to last longer.

Specify Jenkins' METLKOR — the original — the best *Metal Core* brush

METLKOR® CYLINDER BRUSHES and **LIFEWOOD®** WOOD BACKED BRUSHES

JENKINS' METLKOR COATING BRUSH Pure Bristle or Nylon Fill

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Jordan Shell and Plug Fillings

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POSITIVE

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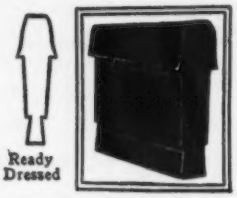

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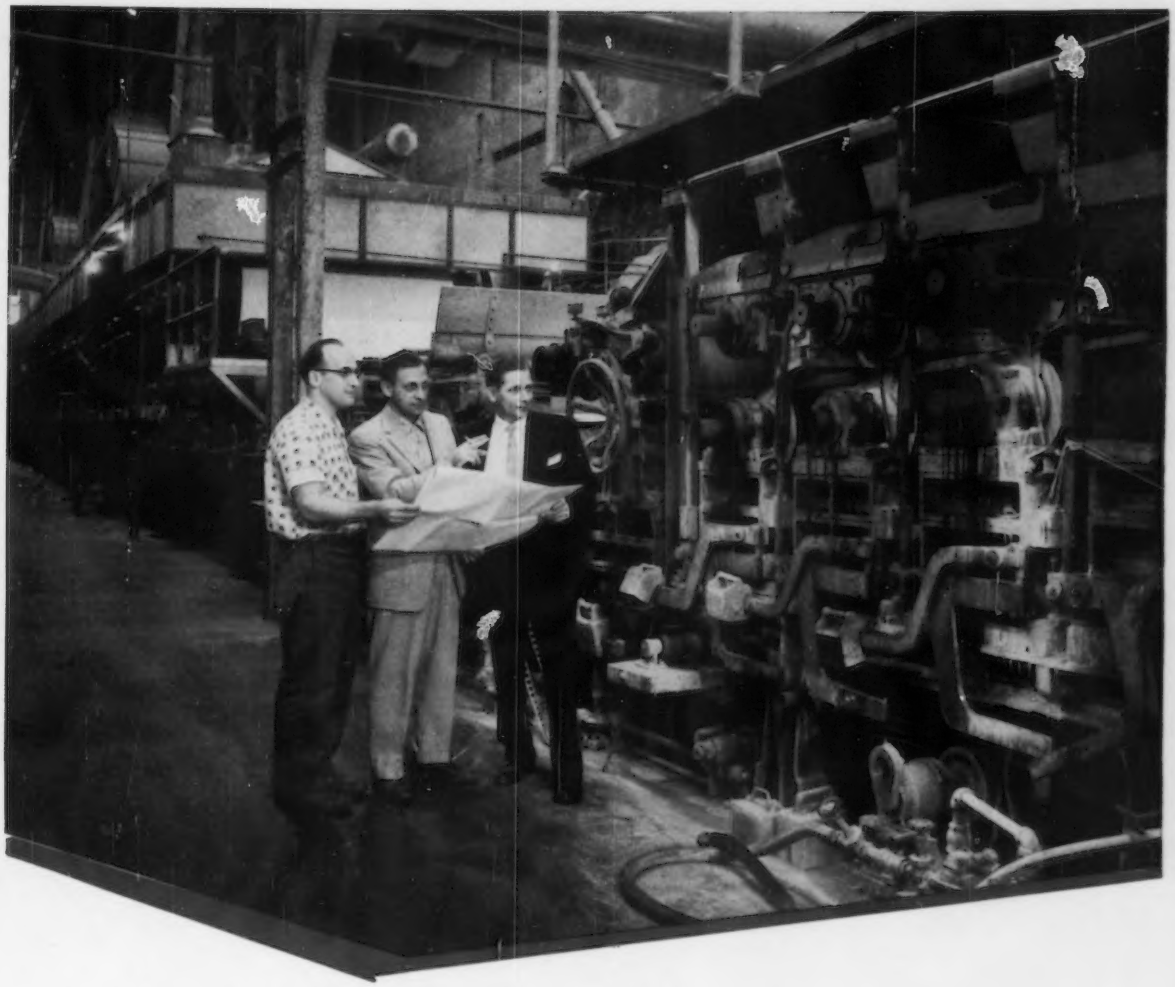

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